

# A TRANSPORTATION STUDY FOR THE CORE AREA OF THE CITY OF DELAFIELD

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report.

MEMORANDUM REPORT  
NUMBER 127

**A TRANSPORTATION STUDY FOR THE CORE  
AREA OF THE CITY OF DELAFIELD  
WAUKESHA COUNTY, WISCONSIN**

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The preparation of this publication was financed in part by planning funds provided by the Wisconsin department of Transportation and the U. S. Department of Transportation, Federal Highway and Federal Transit Administrations.

November 1998

Inside Region \$5.00  
Outside Region \$10.00

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## SEWRPC Memorandum Report No. 127

### A TRANSPORTATION STUDY FOR THE CORE AREA OF THE CITY OF DELAFIELD

#### INTRODUCTION

At the request of the City of Delafield, the Regional Planning Commission staff conducted a review of the need for potential local collector and land access street extensions, as well as a review of existing parking and traffic control in the core area of the City of Delafield. The core area is bounded on the north by Exeter Street and Lake Nagawicka, on the east by First Street, on the south by IH 94, and on the west by Cushing Park Road. The study area is shown in Figure 1.

#### EXISTING STREET AND HIGHWAY SYSTEM CLASSIFICATION

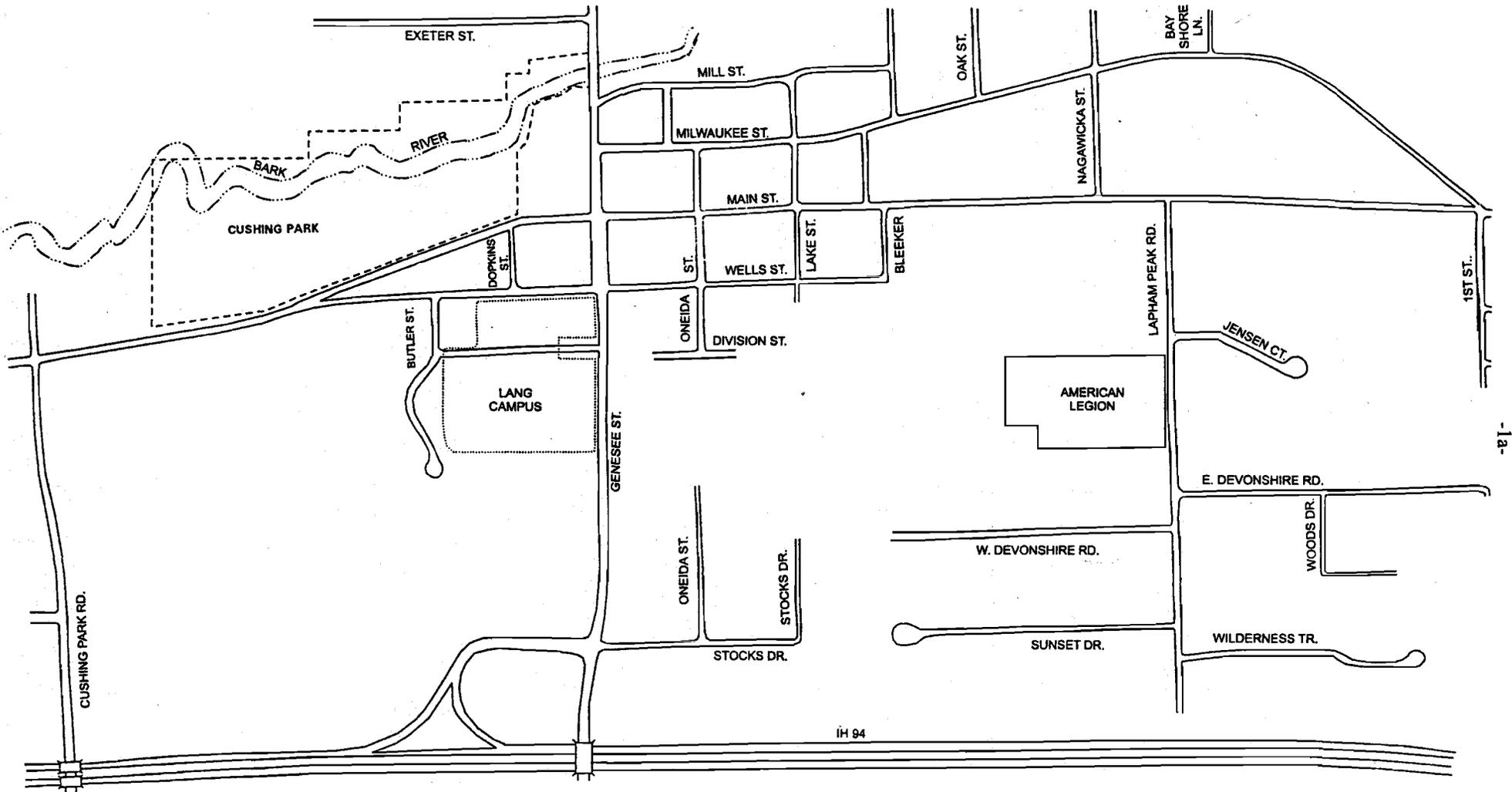
##### Functional Classification

The street and highway system of a community must serve several important functions, including: providing for the free movement of through vehicular traffic; providing access to abutting land uses; providing routes for bicycle and pedestrian traffic, and serving as the location for utilities and storm water drainage facilities.

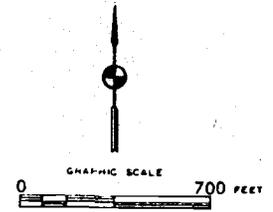
Two of these functions--traffic movement and land access--are basically incompatible. Individual facilities constituting the street and highway system may be classified on the basis of the primary function served, ranging from providing a high degree of travel mobility while providing limited access to adjacent land uses, to providing a low degree of travel mobility while providing a high degree of access to adjacent land uses. Accordingly, three functional classifications of streets and highways should be recognized in any local transportation planning effort: 1) arterial streets; 2) collector streets; and, 3) land access streets.

Figure 1

STUDY AREA FOR THE CITY OF DELAFIELD TRANSPORTATION STUDY



-1a-



Arterials are defined as streets and highways which are intended to serve the through movement of traffic, providing transportation service through an area or between major subareas of a larger area. Access to abutting property may be a secondary function of some types of arterials, but it should always be subordinate to the primary function of traffic movement. Ordinary arterials may carry up to 35,000 vehicles per average weekday, while freeway arterials may carry up to 90,000 vehicles an average weekday.

Collector streets are defined as streets which are intended to serve primarily as connections between the arterial system and the land access street system. In addition to collecting and distributing traffic to and from the arterial streets, collector streets usually provide a secondary function of providing access to abutting property. The maximum desirable and acceptable volume thresholds for a collector street are 3,000 and 4,000 vehicles per average weekday, respectively.

Land access streets are defined as streets which are intended to serve primarily as a means of access to abutting properties, principally serving the residential areas of a community. The maximum desirable and acceptable volume thresholds for a land access street are 1,500 and 2,500 vehicles per average weekday, respectively.

Based upon the manner in which they currently function, the following facilities within the study area may be classified as arterials: IH 94 between Cushing Park Road and Lapham Peak Road; Genesee Street between Main Street and IH 94; Genesee Street (CTH C) between the Bark River and Main Street; Main Street between Cushing Park Road and 1st Street; and Milwaukee Street east of Main Street.

Based upon their location and relationship to other facilities within the study area, Lapham Peak Road from Main Street to its terminus just south of Wilderness Trail; Milwaukee Street from Genesee Street (CTH C) to Main Street; and Cushing Park Road between Main Street and IH 94 may be currently classified as collector streets. The remaining streets within the study area are currently functioning as land access streets.

### Jurisdictional Classification

The jurisdictional classification of a street and highway determines which level of government is responsible for design, construction, maintenance, and operation of a particular facility. All streets and highways within the study area are under the jurisdiction of the City of Delafield with two exceptions. One exception is IH 94 from the west study limit to the east study limit, which is under the jurisdiction of the Wisconsin Department of Transportation. The other exception is the segment of Genesee Street (CTH C) between Exeter Street and Main Street, which is under the jurisdiction of Waukesha County. Thus, the City would be responsible for implementing any street extensions within the study area. However, any extension which may intersect the segment of Genesee Road under the jurisdiction of Waukesha County would require the approval of the County with respect to the design of the intersecting roadway and the intersection traffic control.

### PROPOSED NEW STREETS OR STREET EXTENSIONS

Sound transportation planning practice dictates that the design of the street and highway system within a community should serve to implement the desired development patterns set forth in the community's comprehensive plan. Generally, the provision of new streets or the extension of existing streets will occur as land use development proceeds within the community, or as an existing developed area of a community is redeveloped.

City officials requested that four potential street extensions be evaluated under this study:

- Dopkins Street northerly from its intersection with Main Street to Milwaukee Street extended, and Milwaukee Street westerly from its intersection with Genesee Street (CTH C) to an extended Dopkins Street;
- Butler Street northerly from Wells Street to Main Street;
- Stocks Drive northerly from its current terminus to Lake Street; and

- A new east-west facility between Lapham Peak Road and Genesee Street opposite the Genesee Street entrance to the Lang Campus.

The first two street extensions identified by the City would serve lands that are planned to be redeveloped, while the last two would serve lands which are currently undeveloped.

The City of Delafield adopted a new comprehensive plan in 1991.<sup>1</sup> Under that plan, certain lands within the study area are proposed to be redeveloped and certain other lands are proposed to be developed. The Dopkins Street and Milwaukee Street extensions would serve an area of existing commercial land uses that are envisioned to be redeveloped for new commercial land uses. The Butler Street extension would serve an area of existing and planned medium density residential land use. The Stocks Drive extension and new east-west street would serve an area as yet largely undeveloped lands, which are planned to be developed primarily for medium density residential land uses.

#### The Dopkins Street/Milwaukee Street Extensions

The proposed extensions of Dopkins Street and Milwaukee Street are shown on Figure 2. These street extensions would not create any new street inter-sections, but rather would add a fourth leg to two existing "T" intersections. Dopkins Street and Dopkins Street extended would be stop sign controlled at its intersection with Main Street, which would be uncontrolled. Milwaukee Street and Milwaukee Street extended would be stop sign controlled at its intersection with Genesee Street, and Genesee Street would be uncontrolled. There would be no intersection spacing concerns as a result of these street extensions because no new intersections would be created.

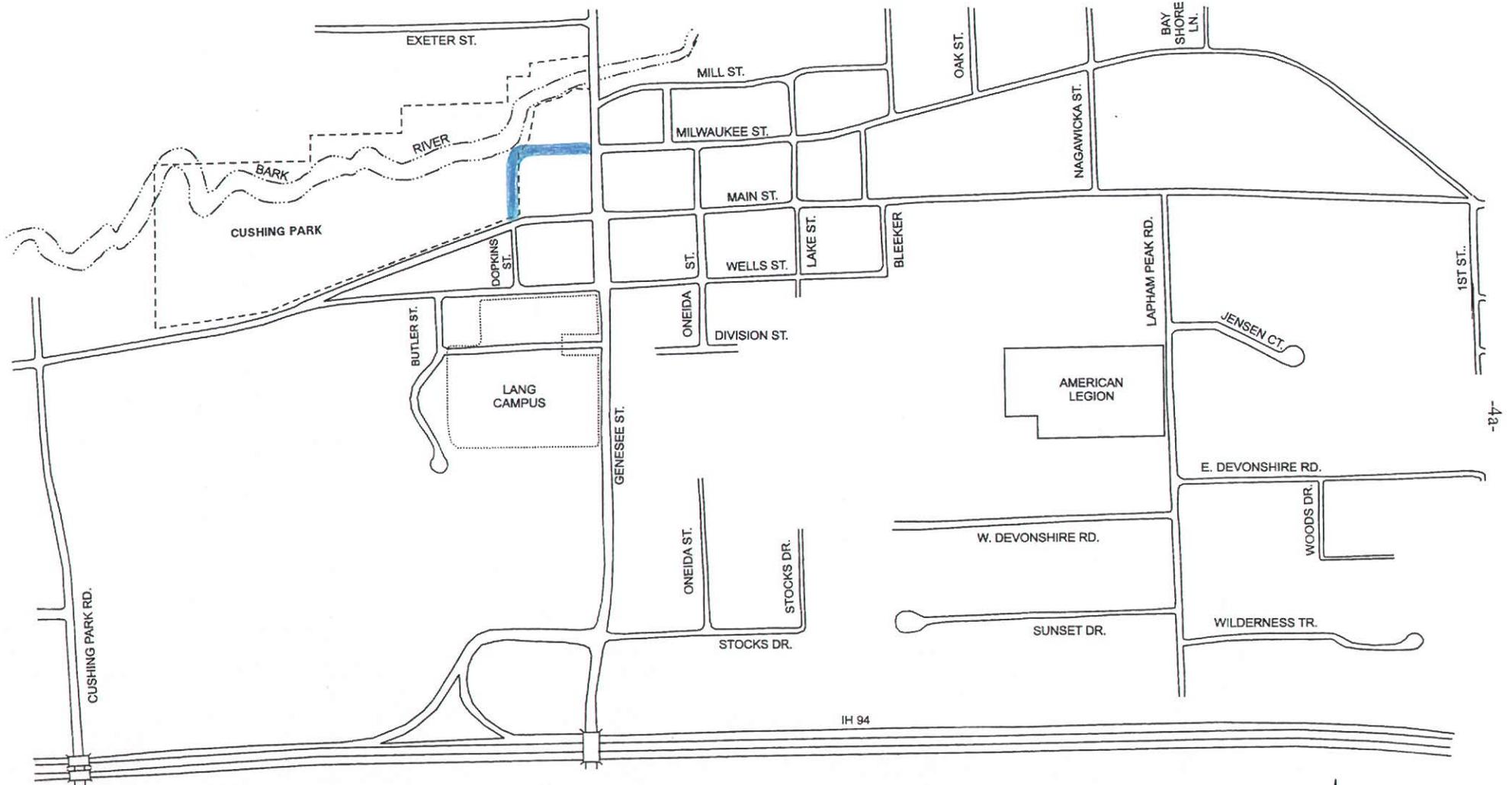
The proposed street extensions would be provided to accommodate planned redevelopment between Main Street and the Bark River, and Dopkins Street and Genesee Street. An advantage of these extensions is that they would provide an alternative means for local traffic to access the development within this city block thereby removing such traffic from Genesee Street (CTH C).

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<sup>1</sup>See "Comprehensive Plan, City of Delafield," Camiros, Ltd., March 1991.

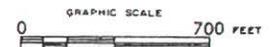
Figure 2

THE PROPOSED EXTENSIONS OF DOPKINS STREET AND MILWAUKEE STREET IN THE CENTRAL BUSINESS DISTRICT



LEGEND

 Proposed Street Extensions



Also, these extensions could be constructed with sufficient width so that off-street parking may be provided.

One potential disadvantage of these street extensions is that additional trips may be generated by any new development or redevelopment accommodated by the extensions. These new trips would access the site of the proposed street extensions via adjacent collectors and arterials and would increase traffic volumes on those facilities. While both Genesee Street--the arterial concerned--and Milwaukee Street--the collector concerned--currently carry average weekday traffic volumes significantly below their design capacity, there is the potential for additional vehicular delay owing to the turning movements entailed at the new intersections even if the volume of traffic generated by new development or the redevelopment does not increase compared to current levels. Motorists on the newly created intersection leg may experience delay as they wait for a gap in cross-street traffic or yield the right of way to vehicles on the opposing leg. Motorists on the intersection leg opposing the newly created intersection leg may experience additional delay as they wait not only for a gap in cross-street traffic, but for traffic on the new leg as well. Motorists in the current traffic lanes on Genesee Street trapped behind vehicles turning left into the new leg would also experience delay.

Another potential problem would be the potential increase in traffic conflicts at the intersection of Milwaukee Street and Genesee Street (CTH C). Vehicular conflict points within the intersection would increase from nine under the current three-legged intersection to 24 under a four-legged intersection thereby increasing the potential for traffic accidents. Similar potential traffic conflict increase would occur at the intersection of Dopkins Street and Main Street.

The Dopkins Street extension is problematic. Based upon information provided by the Wisconsin Department of Natural Resources (WisDNR), all lands within the Cushing Park area have either been transferred from the WisDNR to the City for outdoor recreational purposes, or acquired or developed for outdoor recreational purposes using Federal or State grants. When such lands are proposed to be converted to uses inconsistent with public outdoor recreational uses including public streets and parking lots, the approval of the WisDNR and the National Park Service is required.

Thus, because the extension of Dopkins Street as proposed would occur on lands within the boundaries of Cushing Park, WisDNR and National Park Service approval would be required for the proposed use of a portion of the park lands for a public street. Prerequisites for WisDNR and the National Park Service approval include the evaluation and rejection for cause of all practical alternatives to the proposed conversion, and replacement of the land to be converted with other lands not currently in public ownership and having essentially the same fair market value, size, and utility.<sup>2</sup>

Alternatively, the centerline of the proposed extension could be shifted about 60 feet to the east and a segment of existing Dopkins Street south of Main Street relocated to form a four-legged intersection as shown in Figure 3. Such a shift would require the acquisition of a residence in the southeast quadrant of the Main Street and Dopkins Street intersection.

The extension of Dopkins Street and Milwaukee Street is recommended for consideration because the extensions would serve to implement both the City's comprehensive plan and the City's downtown development plan.

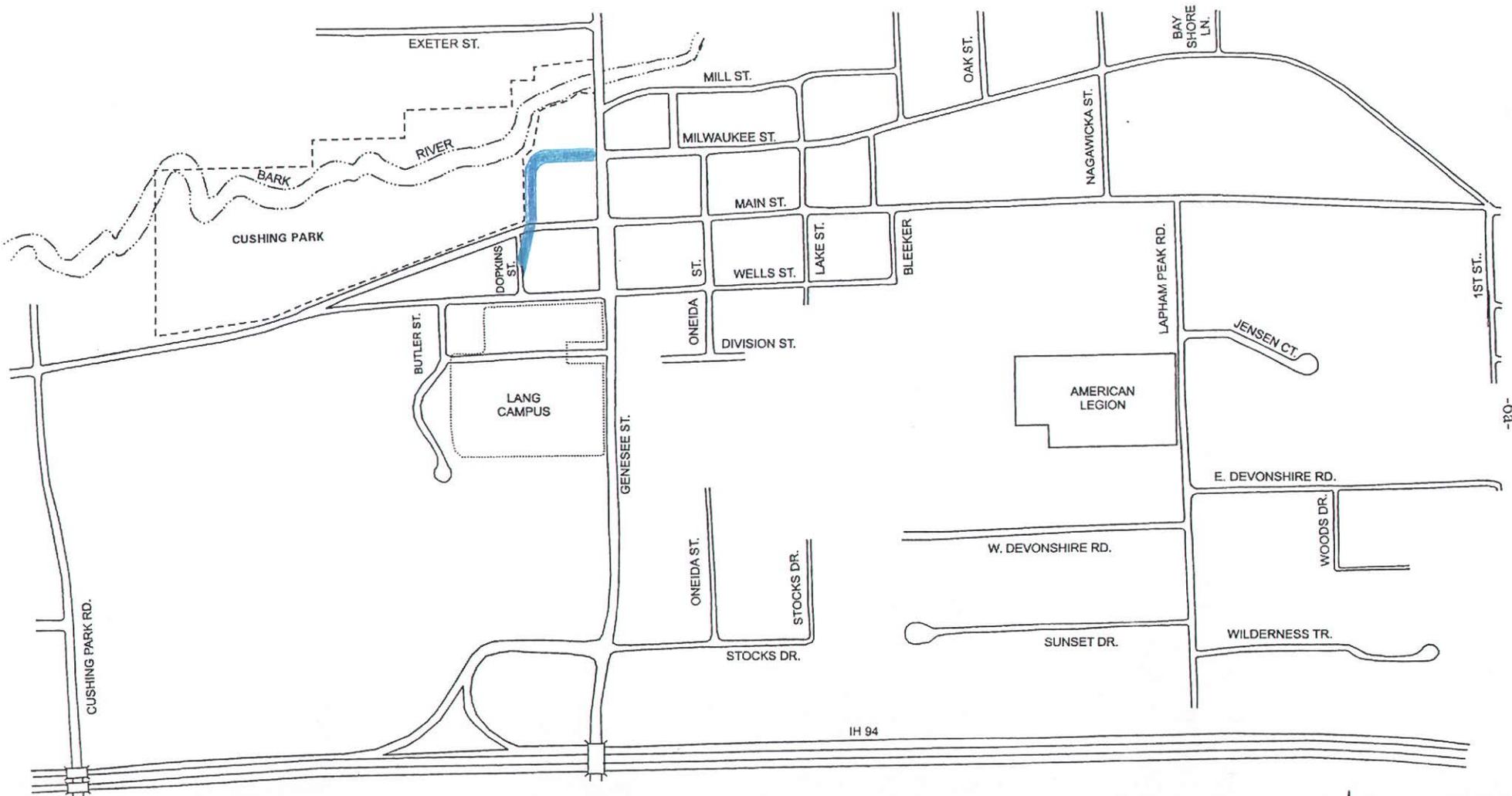
Should the extension of Dopkins Street be found to be infeasible for political reasons, the extension of Milwaukee Street may be considered. Such extension would present some difficulty for the movement of delivery vehicles and the provision of some types of municipal services such as solid waste collection. The need to reverse directions to exit the street after having entered would also limit the amount of parking which could be provided, and require a turn around having an outer curb radius of 45 feet and a right-of-way radius of 60 feet.

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<sup>2</sup> City staff believes that the agreement between the City and the Department of Natural Resources (WisDNR) which transferred the park lands to the City does not specifically require these lands to remain in public recreational land uses, but simply requires that they remain in public uses. While recognizing that the WisDNR has taken the position that the lands must remain in public recreational uses, the City staff believes that the potential exists to use these lands for other public purposes without satisfying the requirements outlined here.

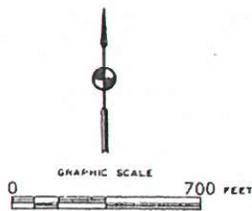
Figure 3

ALTERNATIVE REALIGNMENT OF DOPKINS STREET FROM A POINT SOUTH OF MAIN STREET TO MILWAUKEE STREET EXTENDED



LEGEND

-  Proposed Street Extensions
-  Boundary of Cushing Park



### Butler Street Extension

The proposed extension of Butler Street northerly from Wells Street to Main Street, as shown in Figure 4, would improve access to the Community Center located in Cushing Park, and would also permit elimination of a three-legged "Y" intersection--the intersection of Main Street with Wells Street, located approximately 600 feet west of the intersection of Wells Street and Butler Street. Wells Street would be vacated from Main Street to Butler Street.

The extension of Butler Street would form the third leg of an existing intersection with Wells Street and the third leg of a new public street intersection with Main Street, with the entrance to the Community Center the fourth intersection leg.

The primary advantage of this street extension would be the elimination of a sub-standard, three-legged "Y" intersection with a 17 degree angle of intersection between Wells Street and Main Street. This acute angle of intersection is far less than a desired angle of intersection of 90 degrees, and a minimum acceptable angle of intersection of 60 degrees. The acute angle of intersection requires motorists to look back over their right shoulder to view oncoming traffic.

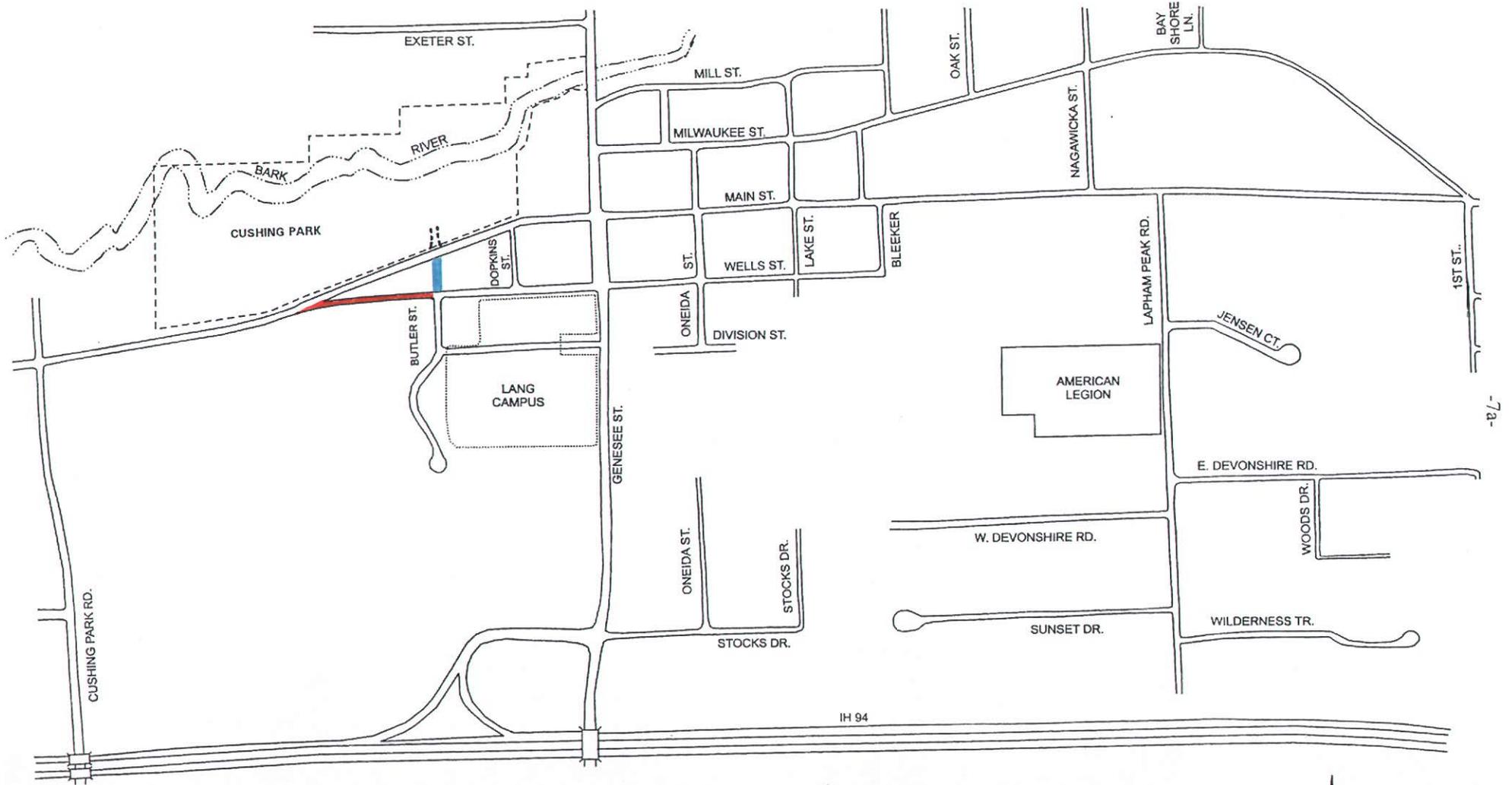
Another potential advantage of this extension is that it would likely redirect to Main Street the truck traffic currently using Wells Street between Genesee Street and Cushing Park Road. Thus, this truck traffic, which is not destined to properties abutting Wells Street, would be redirected to an arterial street rather than utilizing a land access street. Another potential advantage of this extension is that travel to the Community Center would be more direct for persons travelling on Wells Street between Genesee Street and Main Street.

A disadvantage of this extension is that the angle of intersection between the Butler Street extension and Main Street would approximate 70 degrees, which while it does exceed the minimum acceptable angle of intersection, is significantly less than a desirable 90 degree angle of intersection.

Another disadvantage of this extension is that, dependent upon the final design, the acquisition of two residences would be required. Another disadvantage of this extension is that access to the multi-family residential buildings west of Butler Street and south of Wells Street would be reduced

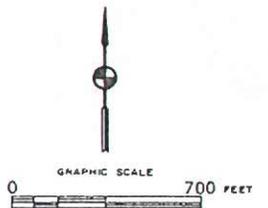
Figure 4

THE PROPOSED EXTENSION OF BUTLER STREET FROM WELLS STREET TO MAIN STREET



LEGEND

-  Proposed Street Extension
-  Existing Street to be Vacated



as the driveway from Wells Street would be eliminated. Finally, while the increase in travel times would be negligible--about 0.1 minute--nevertheless, emergency services response times would be increased slightly between the fire station and points west of Butler Street.

Although the proposed extension of Butler Street would eliminate the substandard intersection geometry at the intersection of Main Street and Wells Street and divert truck traffic from Wells Street between Genesee Street and Main Street, it would require the acquisition and demolition of two residences. Another alternative to correct the substandard intersection geometry which could be considered would realign Wells Street to intersect with Main Street approximately 300 feet north-east of the existing intersection opposite the driveway to parking for the athletic fields in the Fish Hatchery Sports Area, as shown in Figure 5. This realignment would not require the displacement of any residences. Truck traffic could be prohibited from using Wells Street between Main Street and Genesee Street by regulatory signing. Although this alternative would provide some enhancement in circulation for the central business district, the enhancement provided by the northerly extension of Butler Street would be greater.

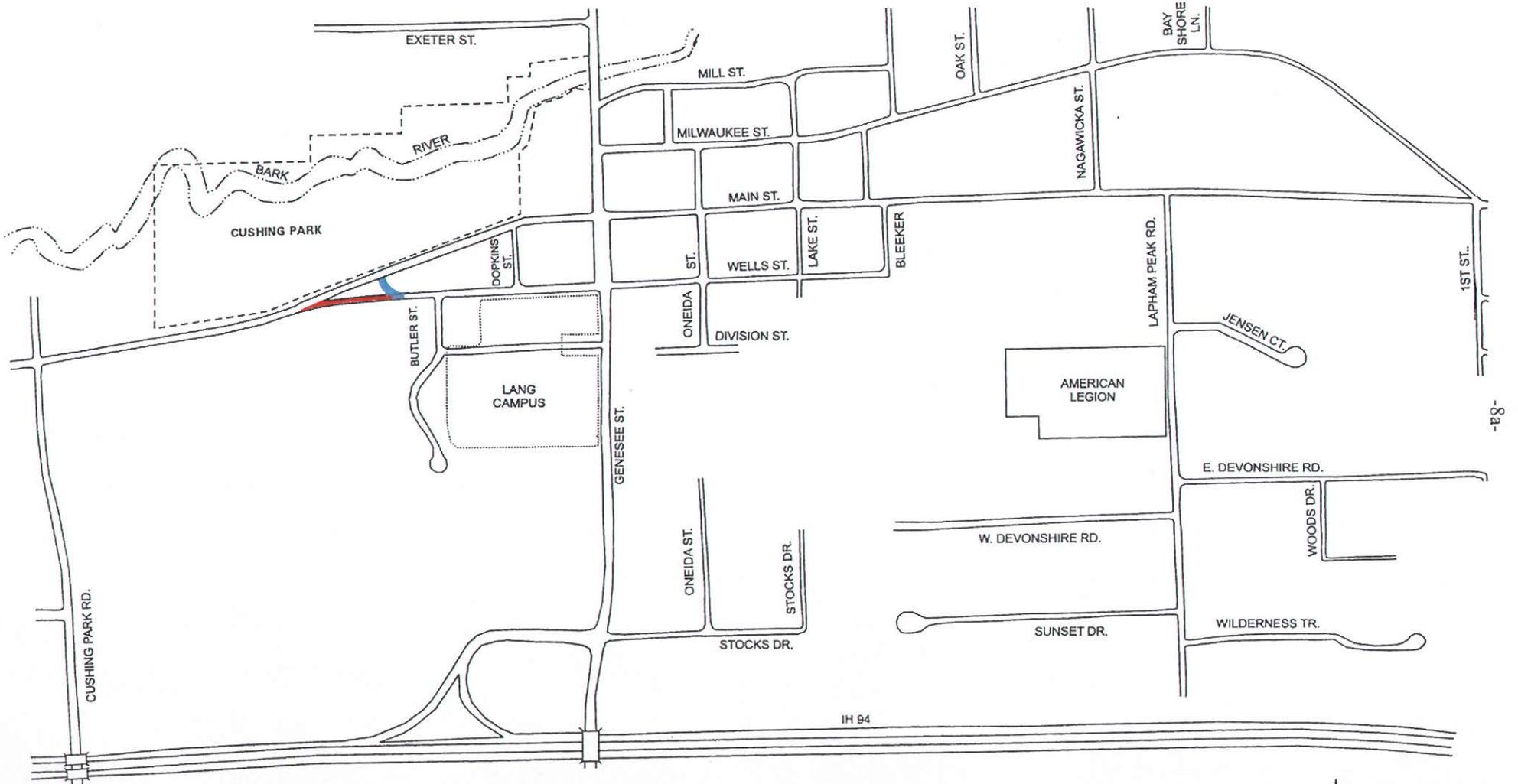
Because the extension of Butler Street would eliminate the substandard intersection geometry at the intersection of Wells Street and Main Street, and has the potential to improve traffic circulation within the central business district as well as the potential to improve access to and from the Lang Campus, the extension of Butler Street is recommended for consideration. Other alternatives, including the alternative which would eliminate the substandard intersection geometry without the attendant disruption of existing land uses but with only modestly enhanced traffic circulation, could also be considered.

#### Extend Stocks Drive From Its Current Terminus to Lake Street and Construct a New Facility Between Lapham Peak Road and Genesee Street

The extension of Stocks Drive from its present northerly terminus to the present southerly terminus of Lake Street, and the provision of a new east-west roadway between Lapham Peak Road and Genesee Street would serve essentially the same undeveloped areas of the neighborhood bounded by Genesee Street, Main Street, Lapham Peak Road, and IH 94. Both streets would serve to

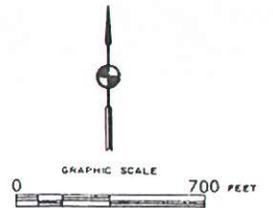
Figure 5

REALIGNMENT OF THE WELLS STREET INTERSECTION WITH MILWAUKEE STREET



LEGEND

- Proposed Street Extensions
- Existing Street to be Vacated



implement the City's comprehensive plan by providing access to land which is currently undeveloped, but which is planned to be converted to medium or high density residential uses.

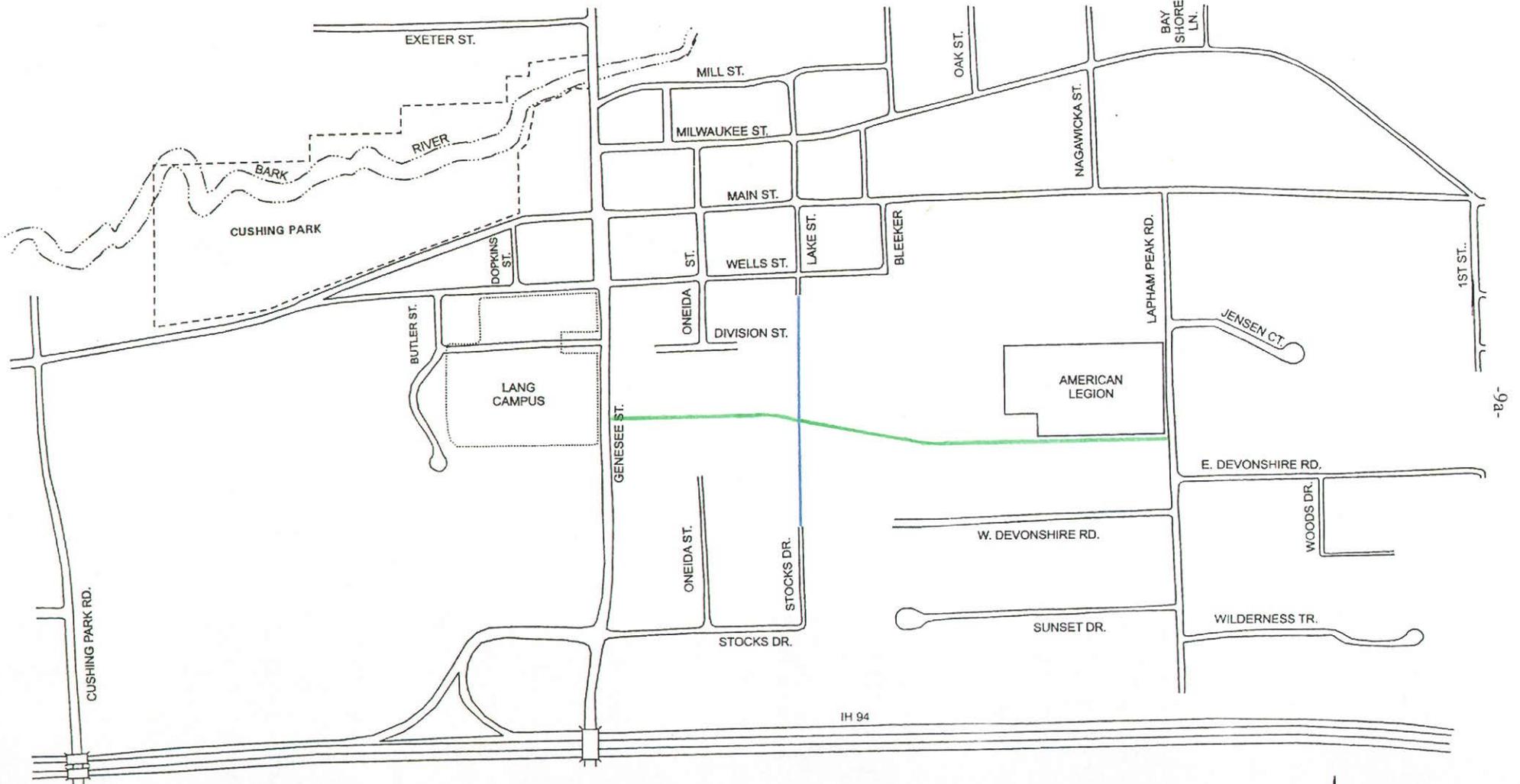
As shown in Figure 6, the length of the proposed Stocks Drive extension would be approximately 1,200 feet, and the length of the new east-west facility would be approximately 2,700 feet. The right of way attendant to each of these roadways would provide a convenient corridor for the location of the utilities required to support urban development in the area including sanitary and storm water sewer, water supply, and electric power, natural gas, and telephone service. The inclusion of sidewalks would provide safe corridors for pedestrian traffic.

The proposed extension of Stocks Drive has one advantage compared to the construction of a new east-west facility between Genesee Street and Lapham Peak Road. The extension of Stocks Drive would not result in any new intersections with either a collector or an arterial street. Construction of a new east-west facility would require two new public street intersections, one with Genesee Street, which is an arterial street, and one with Lapham Peak Road, which is a collector street. Each new intersection is anticipated to be a 90 degree intersection, the most desirable angle of intersection. The new street would become the third leg of an intersection with Genesee Street, with the fourth leg being a driveway serving the Lang Campus on the west side of Genesee Street. At its Lapham Peak Road end, the proposed new street could be constructed within a 60 foot wide easement which abuts the southern boundary of Legion Park. The location of the new intersections with respect to other intersecting streets, and the relationship of the new intersections to the topography were evaluated on the basis of accepted geometric design standards. The distance between the center of the new Lapham Peak Road intersection--which would intersect from the west to the center of the Devonshire Road East intersection, which is a "T" intersection from the east--is approximately 240 feet. This distance does exceed the minimum offset distance between intersecting roadways on opposite sides of a street of 150 feet, but is less than the minimum desirable intersection spacing of 300 feet. Intersection spacing is not a concern on Genesee Street. Adequate stopping sight distance would be available for motorists traveling at the posted speed limit at both new intersections.

Another advantage of the extension of Stocks Drive is that it would eliminate an existing cul de sac

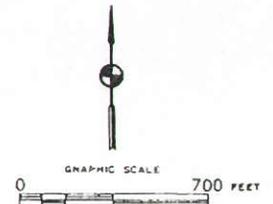
Figure 6

THE PROPOSED EXTENSION OF STOCKS DRIVE FROM ITS CURRENT TERMINUS TO LAKE STREET  
AND THE PROPOSED NEW EAST-WEST FACILITY BETWEEN GENESEE STREET AND LAPHAM PEAK ROAD



LEGEND

- Proposed Stocks Drive Extension
- Proposed New East-West Facility



which is approximately 1,450 feet in length, or nearly twice as long as the maximum acceptable length of 750 feet, and nearly two and one-half times as long as the maximum desirable length of 600 feet.

Both the extension of Stocks Drive and the construction of the new facility as proposed would provide facilities which would extend through the neighborhood and which would function as collector streets. A potential disadvantage of extending a facility through the neighborhood is that it may attract traffic that has neither its origin nor its destination within the neighborhood. Motorists could use either of the proposed facilities to avoid the intersection of Main Street and Genesee Street. The potential diversion of such traffic through the neighborhood would be undesirable, and residents whose properties abut either of these two facilities may express concern about the attendant traffic volumes and vehicular speeds.

Another potential disadvantage of either of the new facilities is that the recommended spacing for collector streets along an arterial street is a minimum of 1,300 feet. The intersection between the proposed new east-west facility and Genesee Street would be located approximately 600 feet south of Main Street or less than half of the recommended 1,300 feet spacing; while the Lake Street intersection with Main Street would be located approximately 950 feet east of Genesee Street, less than three quarters of the recommended spacing.

Another potential disadvantage of a new east-west facility is the increased potential for motor vehicle accidents at the new intersections. The number of vehicular conflict points at the Genesee Street intersection would increase from nine to 24; while the number of vehicular conflict points at the new Lapham Peak Road intersection would total nine.

A potential advantage of constructing a new east-west facility is that presently there are no residences located adjacent to the facility. Traffic volumes may be expected to increase on Stocks Drive with any extension of the street. Another potential advantage of constructing a new east-west facility is that the new east-west street could be constructed to collector street standards, whereas approximately 1,450 feet of Stocks Drive, and approximately 300 feet of Lake Street,

would likely have to be reconstructed to such standards to accommodate the expected increase in traffic volumes. Nevertheless, because the extension of Stocks Drive would not create any new public street intersections, it is recommended that the City consider the extension of Stocks Drive rather than the construction of a new east-west facility.

Some of the potential disadvantages with the Stocks Drive extension could be ameliorated through careful design of the street system. Two alternative street layouts are shown in Figure 7. No street extends all the way through the neighborhood under either alternative, and travel through the neighborhood would have to be indirect thereby discouraging through traffic. Despite the indirection of Stocks Drive extended under Alternative Two, for most residents using Lapham Peak Road to access IH 94 at Genesee Street, a route comprised of the new east-west facility, Stocks Drive, and Stocks Drive extended would provide a shorter, faster route to the freeway than the current route comprised of Lapham Peak Road, Main Street, and Genesee Street. Such diversion would not be possible under Alternative One.

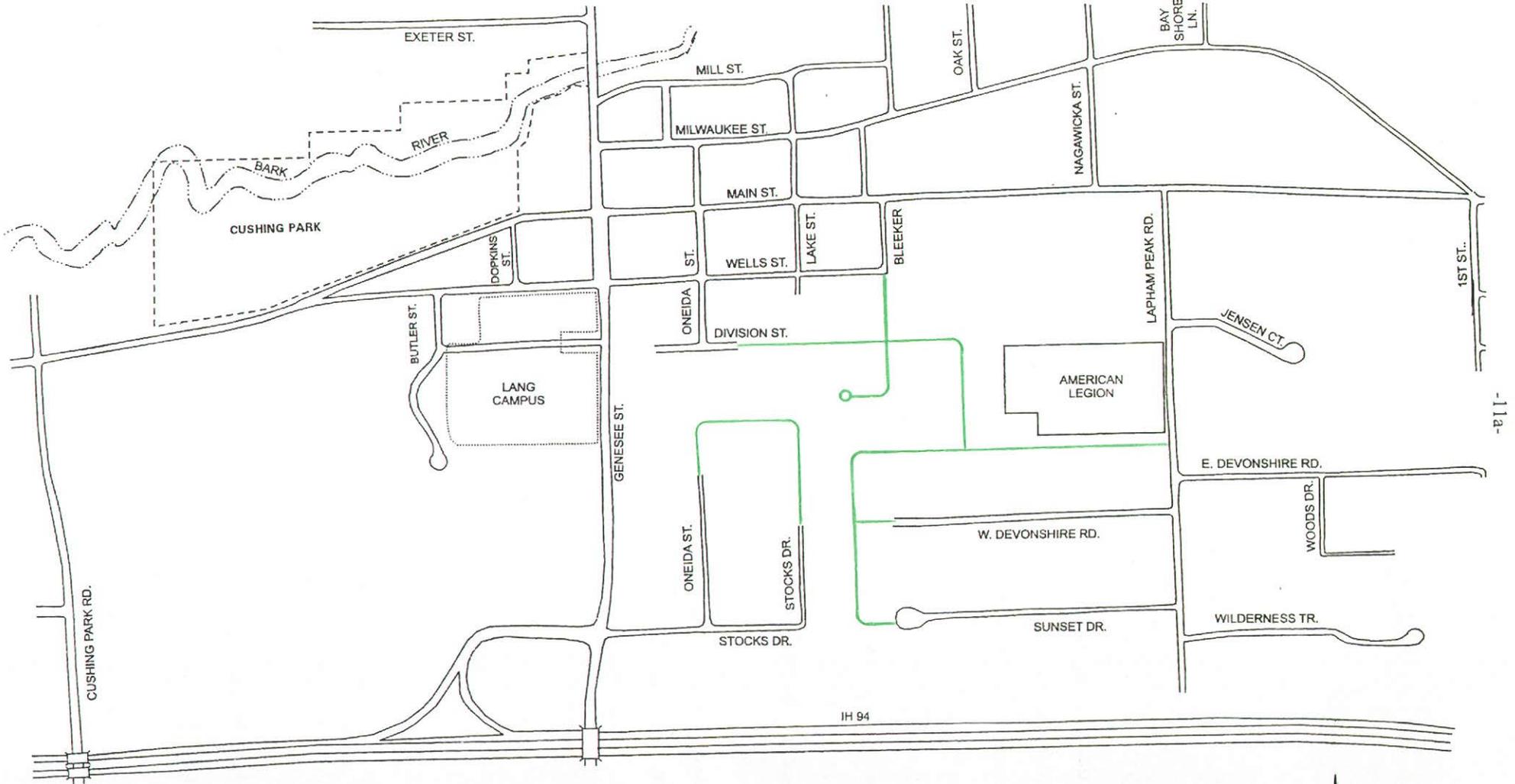
Other alternative local street patterns for the undeveloped lands that would be served by the extension of Stocks Drive or a new east-west street are possible. Accordingly, it is recommended that the City undertake to have a neighborhood development plan prepared for the area concerned. Such a plan would recommend a development pattern including block and lot layout which could meet traffic circulation, storm water drainage, sanitary sewerage, water supply, and land use development needs effectively and efficiently. The preparation of such a plan would involve careful consideration of such factors as soil suitability, land slopes, drainage patterns, flood hazards, woodland and wetland cover, existing and proposed land uses in the neighborhood, and real property boundaries. It would also carefully consider the intersection spacing and angle of intersection criteria concerned.

While necessarily precise, a neighborhood plan should also be flexible. It is intended to be used as a standard for evaluating developmental proposals as such proposals are advanced over time. Proposed plan changes which can be shown to improve upon the adopted plan while remaining compatible with the overall objectives for development of the neighborhood, may be adopted for

Figure 7

ALTERNATIVE STREET LAYOUT FOR THE NEIGHBORHOOD TO BE SERVED BY  
AN EXTENSION OF STOCKS STREET AND A NEW EAST-WEST FACILITY

Alternative One



-112-

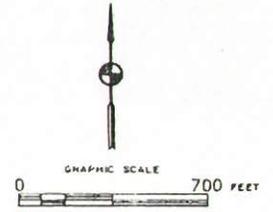
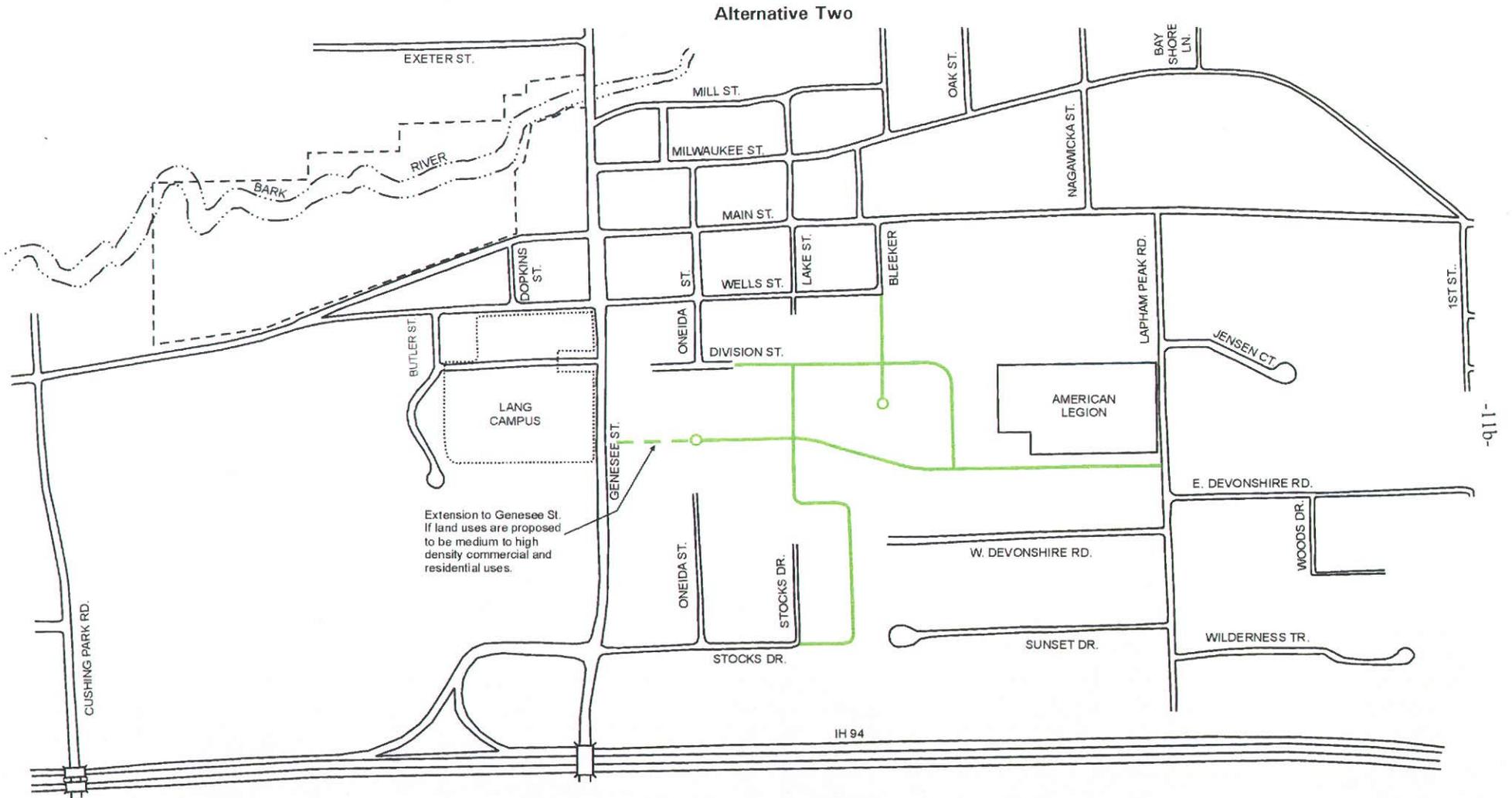


Figure 7 (continued)

ALTERNATIVE STREET LAYOUT FOR THE NEIGHBORHOOD TO BE SERVED BY  
AN EXTENSION OF STOCKS STREET AND A NEW EAST-WEST FACILITY



implementation. Thus, the adopted plan would serve as a point of departure for development decision-making, subject to improvement as changing conditions may dictate.

## PUBLIC PARKING

Public parking facilities are an essential element of a community's transportation system. Such facilities are comprised of on-street curb parking spaces and off-street surface lot or parking structure spaces. An inadequate supply of public parking in terms of the number of spaces provided, the time parking restrictions applied, or the parking facility locations may be manifested in a number of ways, including: 1) traffic flow disruption and congestion as vehicles stop in moving traffic lanes to wait for and to maneuver into available parking spaces or to permit other vehicles to exit parking spaces; 2) motor vehicle accidents caused in part by restricted visibility due to illegally parked vehicles or by unexpected maneuvers by motorists frustrated by an extended search for an available parking space; 3) a possible loss of commercial business in areas affected by the parking problem, particularly when parking demand exceeds the available supply; 4) excessive air and noise pollution and fuel consumption as vehicles circulate on the local street system in search of available parking spaces; and, 5) an overflow of parked vehicles into adjacent residential neighborhoods.

The current public parking supply within the central business district of the City of Delafield consists of both off-street and on-street parking spaces. For the purposes of this study, every on-street parking space was assumed to be a public space with three exceptions: those parking spaces clearly a part of the sites for Gary's Auto, Tom's Auto Body, and Wholly Cow Frozen Custard and Sandwich Shop. Also for the purposes of this study, only paved parking spaces were considered.

On-street parking is typically provided on a paved area abutting the traffic lanes of a street known as a parking lane. Parking lanes typically have a uniform width and typically extend for several blocks. In the City of Delafield atypical parking lanes have been constructed in several locations. These atypical parking lanes frequently appear to have been provided for specific parcels abutting the street. At more than one location, although the parking lane is continuous across abutting parcels, the width varies between parcels with sufficient width for only parallel parking on one

parcel, but with sufficient width for 90 degree angle parking on the abutting parcel.

Off-street parking is that parking provided on a parcel of land which may abut, but which is not part of the street right of way. It is connected to an adjacent street by a driveway or driveways, and may be a single-level surface lot or a multi-level parking structure.

There are two types of parking space, parallel and angle. A parallel parking space is oriented parallel to the centerline of a roadway or the aisle of a parking lot. An angle parking space is oriented at an angle to the centerline of a roadway or the aisle of a parking lot. The primary advantage of angle parking compared to parallel parking is that, for a given distance, more parking spaces become available as the angle increases. At 90 degrees, or perpendicular to the street centerline or parking lot aisle, nearly 2.5 times more angle parking spaces would be available than parallel parking spaces. The primary disadvantage of angle parking is that as the parking angle increases, the amount of roadway or aisle required for maneuvering into and out of the parking space also increases. Another disadvantage is that the potential hazard of stopping, starting, and turning in moving traffic streams also increases. This is of particular concern on a public street where interruptions to traffic flow can cause a degradation of roadway capacity and safety.

An inventory of public parking supply was conducted by the Regional Planning Commission in December 1997 within the area shown in Figure 8. The inventory included off-street as well as on-street parking spaces.<sup>3</sup> Based upon that inventory, there were in 1997 a total of about 292 public parking spaces within the area concerned. Of the 292 total public parking spaces, 240, or about 82 percent, were on-street parking spaces; while 52, or 18 percent, were off-street public parking spaces. None of the public parking spaces were located are in a parking structure.

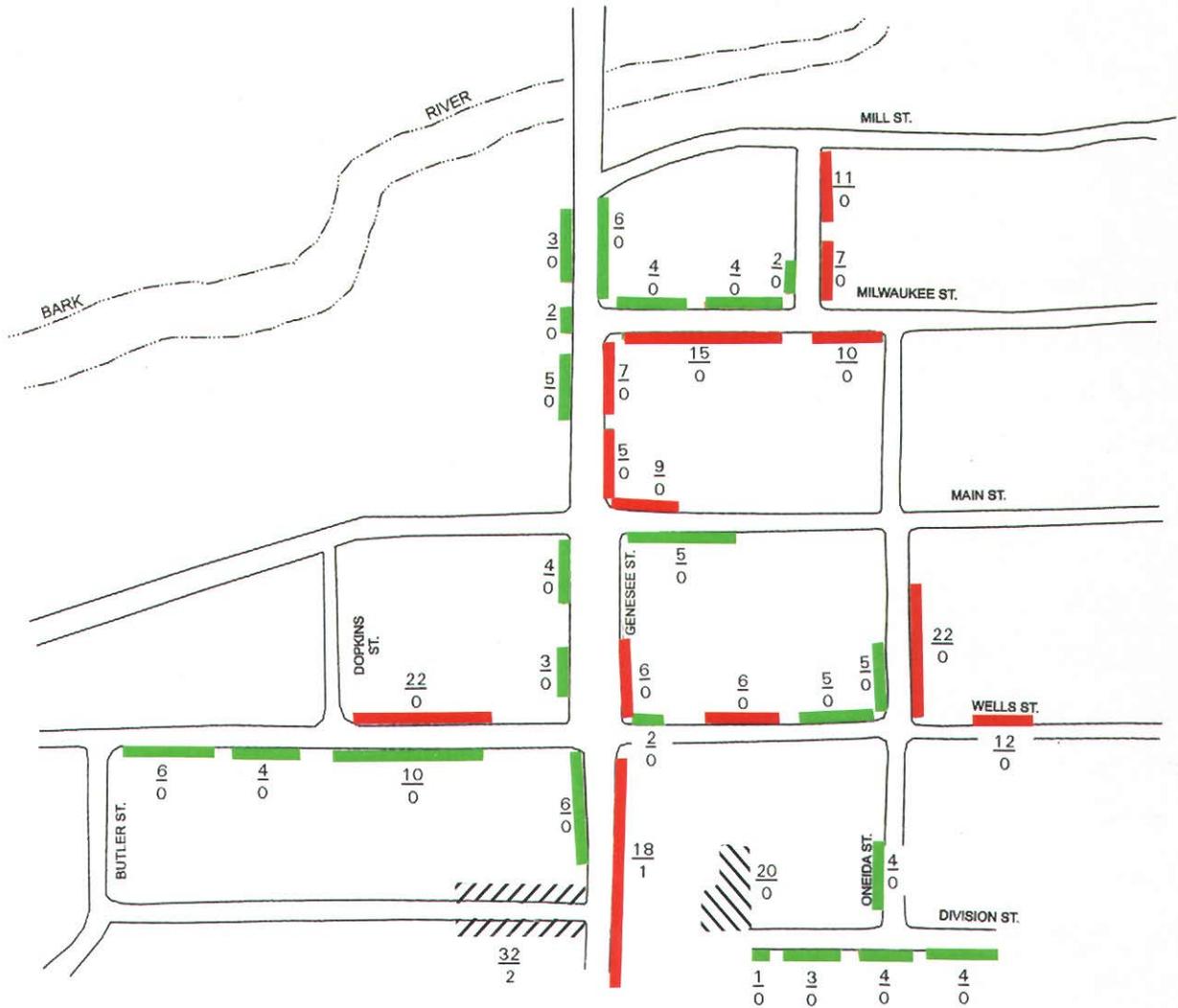
Of the 240 on-street parking spaces, about 148 spaces, or about 62 percent, were angle parking

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<sup>3</sup>The area selected for the inventory of public parking spaces is slightly larger than the area defined as the City's central business district in the City's downtown plan adopted in 1993. The number of parking spaces was determined by counting the number of spaces marked on the pavement, or estimated by dividing the length of unmarked area by the length of a parking space.

Figure 8

NUMBER OF PUBLIC PARKING SPACES BY LOCATION  
 IN THE CITY OF DELAFIELD CENTRAL BUSINESS DISTRICT: 1997



LEGEND

- █ On-street Angle Parking
- █ On-street Parallel Parking
- ▨ Off-street Angle Parking

$\frac{32}{2}$  Total Parking Spaces  
 Handicap Parking Spaces



Not to Scale

spaces, with the remaining 92 spaces, or 38 percent, being parallel parking spaces. The location of the angle and the parallel on-street parking spaces are shown on Figure 8. All of the off-street parking spaces are 90 degree, angle parking spaces.

Based upon Commission staff observations made between the hours of 9:00 a.m. and 5:00 p.m. on several days in January 1998, the supply of public on-street and off-street parking spaces available was generally adequate to meet the current average weekday parking demand; that is, less than 85 percent of all on-street parking spaces were observed to be occupied at any time. Thus, there was sufficient parking reserve for motorists to circulate and find a parking space within 600 feet of their destination within a reasonable search time. However, an adequate supply of parking within the central business district was identified as a key concern during the preparation of the City's Downtown Development Plan in 1993.<sup>4</sup> That plan recommends that development densities be increased within the central business district, and it may be anticipated that as development densities are increased, a demand for additional parking will be created. Furthermore, special events sponsored by the Lang Company may create parking demand during those events well in excess of the existing supply within the City's central business district. This demand is currently satisfied in part through the use of shuttles operated between the Lang Campus and satellite parking located at such sites as Cushing Elementary School and Fireman's Park for the largest events. Thus, it may be concluded that additional parking may be needed within the City's central business district.

The Downtown Development Plan recommended the provision of additional on-street and off-street parking spaces. The additional on-street parking spaces are recommended to be provided on Oneida Street, Milwaukee Street and its extension, and Dopkins Street and its extension. As shown on Figure 8, there is currently a significant amount of on-street parking on Milwaukee Street. Further, in addition to the public on-street parking shown on Oneida Street, there is also some private angle parking providing five spaces on the east side and six spaces on the west side of Oneida Street between Main Street and the alley to the north. These spaces are dedicated to Gary's

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<sup>4</sup>See "Downtown Development Plan, Delafield, Wisconsin," Discovery Group, Ltd. August, 1993

Auto and Wholly Cow Custard, respectively. Finally, there are 14 unpaved angle parking spaces located along the east side of Dopkins Street just north of Wells Street.

Four potential off-street parking lot sites were identified in the City's Downtown Development Plan: 1) a "Community" lot located in the northwest quadrant of the intersection of Main Street and Dopkins Street extended; 2) a "Municipal" lot located in the northwest quadrant of the intersection of Division Street and Oneida Street; 3) an "Oneida" lot located in the north- and southeast quadrants of the intersection of Main Street and Oneida Street; and, 4) a "Mill" lot located adjacent to Mill Street north of the Colonial Inn.

#### On-Street Parking

As previously noted, the provision of on-street parking was recommended on Oneida Street south of Milwaukee Street, Milwaukee Street and its extension, and Dopkins Street and its extension in the City's Downtown Development Plan. The existing segments of these facilities are about 1,550 feet in length and on-street parking is currently provided along a total of about 1,675 feet, or about 54 percent, of the total 3,100 foot length along which on-street parking could be provided.

The existing pavement width on Oneida Street from Division Street to Milwaukee Street is 20 feet and the existing pavement width on Dopkins Street from Wells Street to Milwaukee Street is 18 feet. The existing pavement width on Milwaukee Street from Genesee Street to Oneida Street (north) is 54 feet with angle parking permitted on the south side and parallel parking permitted on the north side of the street. The existing pavement width on Milwaukee Street from Oneida Street (south) to Oneida Street (north) is 46 feet with angle parking permitted on the south side.

In commercial areas, the recommended minimum width of a parallel parking lane is nine feet and parking lanes are recommended to be provided on both sides of the roadway.<sup>5</sup> The minimum acceptable pavement width for land access streets is 20 feet, and the minimum desirable pavement

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<sup>5</sup>The roadway pavement and parallel parking lane widths set forth herein reflect the standards used by the American Association of State Highway and Transportation Officials.

width is 22 feet. The minimum acceptable pavement width for collector streets is 36 feet, and the desirable pavement width is 48 feet. Thus, in order to provide parallel parking on both sides of the street meeting these standards, Oneida Street would need to be widened by a minimum of 18 feet from its present width of 20 feet; and Dopkins Street would need to be widened a minimum of 22 feet from its present width of 18 feet. In order to provide parallel parking on the north side of Milwaukee Street, the pavement would have to be widened by a minimum of nine feet from its present width of 46 feet. Further, providing sidewalks so that parkers would not be forced to walk in the street to their destination would require an additional six feet on each side of the roadway except on the north side of Milwaukee Street where a sidewalk exists. Thus, the provision of sidewalks and parallel parking within the existing 66 foot wide right-of-way would be feasible.

It is estimated, given the amount of on-street parking currently available, and the location of existing driveways and alleys, and required corner and driveway clearances that about 40 additional on-street parallel parking spaces could be provided on existing streets at the periphery of the central business district. Specifically, it is estimated that about 11 new parallel parking spaces could be provided on Dopkins Street between Wells Street and Main Street, about four such spaces could be provided on Milwaukee Street between Oneida Street south of Milwaukee Street and Oneida Street north of Milwaukee Street, and about 24 such spaces could be provided on Oneida Street between Division Street and Milwaukee Street.

Widening the existing pavement on these streets to provide the additional parking would be disruptive and would cost an estimated \$270,000. The on-street parking, generally, would be no more convenient than the proposed off-street parking lot sites, and may, in some instances, be less convenient than the proposed off-street parking. The provision of additional on-street parking spaces would encourage non-residential traffic circulation on Dopkins Street and Oneida Street--streets which basically serve abutting residential land uses--as these streets become destinations for motorists searching for parking spaces. Thus, provision of additional on-street parallel parking is not recommended at the current time and the provision of angle parking would not be recommended in any case because of its added potential to create a safety problem.

It is recommended, however, that the provision of parallel on-street parking be considered as development densities are increased within the central business district and as Oneida Street and Dopkins Street require reconstruction to accommodate increases in development densities and changes from residential to commercial land uses, or when the pavements concerned reach the end of their useful life and need to be reconstructed. It is further recommended that when Dopkins Street and Oneida Street require reconstruction, consideration be given to replacing the current angle parking spaces with parallel parking spaces both to eliminate the safety hazard attendant to angle parking and to provide proper storm water drainage. The cost to reconstruct these facilities with sufficient width to provide parallel parking is estimated at \$250,000. Finally, it is recommended that consideration be given to providing nine foot wide parking lanes on both sides of the proposed extensions of Dopkins Street and Milwaukee Street should the City elect to proceed with those street extensions.

As previously noted, the provision of on-street angle parking is not recommended under any circumstances because of the potential safety hazard it represents. The principal hazard in angle parking is the lack of adequate visibility for the driver during the back-out maneuver. A second hazard results from drivers who stop suddenly when they see a vehicle ahead in the process of backing out. Because empty parking stalls are difficult to perceive with angle parking, a third hazard results from motorists who are seeking a place to park. They must either proceed slowly, thus interfering with traffic movement, in order to see an empty stall or slow abruptly when they come upon an empty stall. These hazards are significant on arterial facilities where efficient traffic movement is a major objective. Thus, it is recommended that the City consider, at a minimum, the conversion of the current on-street angle parking on the arterial streets--Genesee Street and Main Street--to parallel parking. The advantage would be an improvement in traffic safety. This would result in a loss of about 12 on-street parking stalls. The cost is estimated at \$3,500.

#### Off-Street Parking

Four potential off-street parking lot sites were identified in the City's Downtown Development Plan: 1) the "Community" lot located north of Main Street adjacent to the proposed extension of Dopkins Street; 2) the "Municipal" lot located in the northwest quadrant of the intersection of

Division Street and Wells Street; 3) the "Oneida" lot located in the southeast and northeast quadrants of the intersection of Main Street and Oneida Street; and 4) the "Mill" lot located in the southwest quadrant of the intersection of Mill Street and Oneida Street. Three additional potential sites were identified by the Commission: 1) the "Dela-Hart" lot located adjacent to Butler Street west of the Lang Campus; 2) the "Dopkins" lot located adjacent to Dopkins Street between Wells Street and Main Street; and, 3) the "Main" lot located in the southwest quadrant of Main Street and Oneida Street. The seven potential sites for new off-street parking lots together with the two existing municipal lots are shown in Figure 9. The advantages and disadvantages of each potential new site are summarized in Table 1.

With respect to off-street parking, it is recommended that consideration be given to the construction of additional off-street parking lots at selected locations to provide additional parking spaces. The recommended off-street parking lot sites include: Dela-Hart, Dopkins, Municipal, and Main. The Dopkins, Municipal, and Main sites are the most centrally located within the central business district and, thus, provide the most flexibility in meeting increasing parking demand whether for employee parking, customer parking attendant to increased development densities, or special events. The Dela-Hart site is less centrally located, but would specifically address parking demand attendant to special events on the Lang Campus. Off-street parking preserves the capacity of and enhances safety on existing streets by removing the parking maneuvers from the streets and providing a setting where searching and stopping for and maneuvers into and out of parking spaces are expected. The cost to construct the four recommended lots is estimated at \$805,000. It is also recommended that the City work with the Lang Companies to share in the costs of developing the Dela-Hart site because the special event parking demand is generated by events sponsored by the Lang Companies.

Three potential off-street sites shown on Figure 9 are not recommended for consideration and include the Community, Mill, and Oneida sites. The Community site was not recommended because the prerequisites imposed by the Wisconsin Department of Natural Resources and the National Park Service for the conversion of the park lands from the existing public outdoor recreational use effectively prohibit conversion of this site to any other use. Although strategically

Figure 9

POTENTIAL OFF-STREET PARKING SITES IN THE CITY OF DELAFIELD CENTRAL BUSINESS DISTRICT

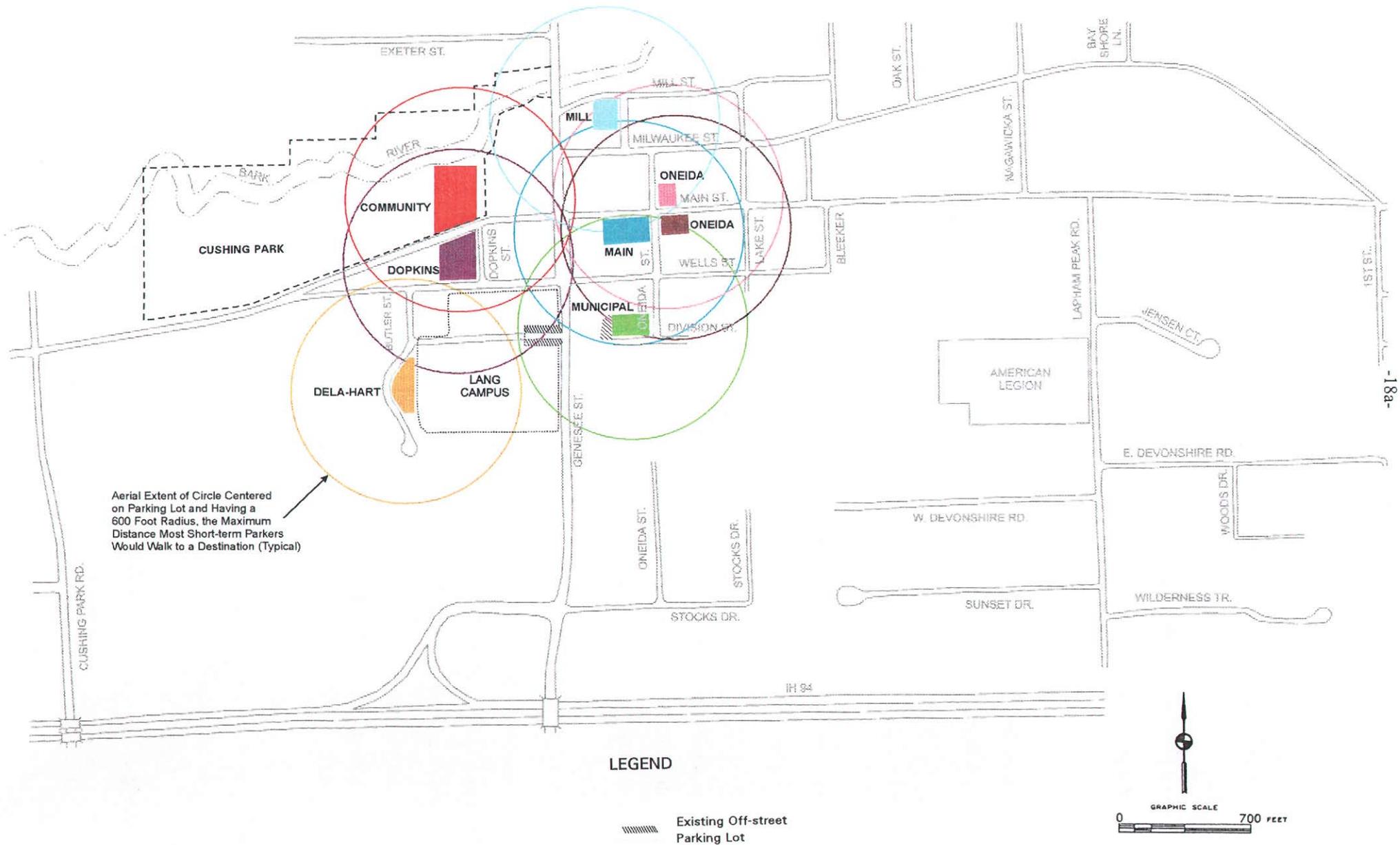


Table 1

THE ADVANTAGES AND DISADVANTAGES OF THE POTENTIAL OFF-STREET PARKING LOT SITES  
IN THE CITY OF DELAFIELD CENTRAL BUSINESS DISTRICT

Potential Off-Street Parking Lot Sites (Shown in Figure 9)	Advantages	Disadvantages	Estimated Parking Lot Construction Cost
Community	<p>A surface lot could be constructed to provide approximately 200 parking stalls<sup>a</sup></p> <p>Would serve long-term employee parking demand within the central business district and the short-term customer parking generated by the commercial development in an area bounded by the Bark River on the north, Genesee Street (CTH C) on the east, and Wells Street on the south and in particular new development which may result from the proposed extension of Dopkins Street and Milwaukee Street<sup>b</sup></p> <p>Would serve the Community Center located in the former Fish Hatchery building</p> <p>Has the potential to reduce undesirable traffic circulation as motorists circle a block waiting for a parking space to become available</p> <p>Has the potential to preserve roadway capacity and enhance traffic safety by removing parking maneuvers from public streets</p> <p>No commercial or residential land uses would be displaced</p> <p>Site may be suitable for parking structure</p>	<p>The site is located within Cushing Park, and is currently in outdoor recreational uses.</p> <p>Federal and state funds were used to acquire or develop Cushing Park and, therefore, the lands would generally be required to remain in public recreational uses, although the City staff believes that the City's agreement with the Wisconsin Department of Natural Resources (WisDNR) would permit conversion to other public uses. Should the approval of the WisDNR and the National Park Service be required for conversion of these lands to non-recreational uses, it may be expected that the prerequisites for approval would include consideration and rejection for cause of all practical alternatives, and the replacement of converted lands with lands having essentially the same fair market value, size, and utility.</p> <p>Studies indicate that employees prefer to park as close to their place of employment as possible and, thus, incentives may be required to encourage employee use of the lot, particularly because employee parking is generally located at the furthest point in the lot</p> <p>The lack of a continuous sidewalk system within the central business district would require the construction of sidewalks between the site and Genesee Street to prevent the need for pedestrians and vehicles to share roadways which would result in a potential pedestrian safety problem and may act as a deterrent to the use of this lot</p>	<p>\$400,000</p>

Table 1 (Continued)

Potential Off-Street Parking Lot Sites (Shown in Figure 9)	Advantages	Disadvantages	Estimated Parking Lot Construction Cost
Community (Continued)		With the exception of Genesee Street, the current level of street lighting within the central business may act as a deterrent to the use of this lot after dark unless it is improved	
Municipal	<p>A surface lot could be constructed to provide approximately 60 parking stalls<sup>a</sup></p> <p>Would serve long-term employee parking demand within the central business district and the short-term customer parking generated by City Hall and the library, and by the commercial development in an area bounded by Main Street on the north, and Dopkins Street on the west<sup>b</sup></p> <p>Has the potential to reduce undesirable traffic circulation as motorists circle a block waiting for a parking space to become available</p> <p>Has the potential to preserve roadway capacity and enhance traffic safety by removing parking maneuvers from public streets</p> <p>No commercial or residential land uses would be displaced</p> <p>Site could be converted to multi-use building in the future with parking and an expanded City Hall or a new library or senior center in a single structure</p> <p>Because of the difference in elevations between Oneida Street and Division Street, it may be possible to construct a two level parking structure on this site without ramps in the structure itself</p> <p>Sidewalk exists between proposed parking lot and Genesee Street</p>	<p>Studies indicate that employees prefer to park as close to their place of employment as possible and, thus, incentives may be required to encourage employee use of the lot, particularly because employee parking is generally located at the furthest point in the lot</p> <p>With the exception of Genesee Street, the current level of street lighting within the central business may act as a deterrent to the use of this lot after dark unless it is improved</p>	\$120,000

Table 1 (Continued)

Potential Off-Street Parking Lot Sites (Shown in Figure 9)	Advantages	Disadvantages	Estimated Parking Lot Construction Cost
<p>Oneida (Shown as two sites in Figure 9)</p>	<p>One surface lot could be constructed in the northeast quadrant of the Main Street and Oneida Street intersection to accommodate approximately 24 parking stalls, and the existing lot in the southeast quadrant of the same intersection could be reconstructed to provide approximately 39 parking stalls--an increase of 19 stalls--or a total of about 63 parking stalls<sup>c</sup></p> <p>Would serve long-term employee parking demand within the central business district and the short-term customer parking generated by City Hall and the library, and by the commercial development in an area bounded by Mill Street on the north, and Genesee Street on the west<sup>b</sup></p> <p>Has the potential to reduce undesirable traffic circulation as motorists circle a block waiting for a parking space to become available</p> <p>Has the potential to preserve roadway capacity and enhance traffic safety by removing parking maneuvers from public streets</p> <p>The lot in the southeast quadrant of the Main Street and Oneida Street intersection would not require the displacement of any residential nor commercial buildings</p> <p>The parking demand attendant to the existing business would be eliminated</p>	<p>The lot in the northeast quadrant of the Main Street and Oneida Street intersection would require the acquisition and displacement of Gary's Auto</p> <p>The net gain in off-street parking spaces would be about 43 spaces</p> <p>Owing to the nature of the business on that site, the lot in the northeast quadrant of the Main Street and Oneida Street intersection may require hazardous material clean-up</p> <p>Studies indicate that employees prefer to park as close to their place of employment as possible and, thus, incentives may be required to encourage employee use of the lot, particularly because employee parking is generally located at the furthest point in the lot</p> <p>This site is located at the periphery of the central business district with the distance between Oneida Street and Genesee Street about 450 feet or nearly the 600 feet which short-term parkers are willing to walk. Thus, this lot would be most suitable for employee parking and may be under-utilized</p> <p>The lack of a continuous sidewalk system within the central business district would require the construction of sidewalks between the site and Genesee Street to prevent the need for pedestrians and vehicles to share roadways which would result in a potential pedestrian safety problem and may act as a deterrent to the use of this lot</p>	<p>\$126,000</p>

Table 1 (Continued)

Potential Off-Street Parking Lot Sites (Shown in Figure 9)	Advantages	Disadvantages	Estimated Parking Lot Construction Cost
Oneida (Continued)		With the exception of Genesee Street, the current level of street lighting within the central business may act as a deterrent to the use of this lot after dark unless the lighting is improved	
Mill	<p>The existing surface lot could be reconstructed to provide approximately 38 parking stalls--an increase of about 26 stalls<sup>d</sup></p> <p>Would serve long-term employee parking demand within the central business district and the short-term customer parking demand generated by the commercial development in an area bounded by the Bark River on the north, Main Street on the south, and Dopkins Street on the west including the area served by the proposed extension of Milwaukee Street and Dopkins Street<sup>b</sup></p> <p>Has the potential to reduce undesirable traffic circulation as motorists circle a block waiting for a parking space to become available</p> <p>Has the potential to preserve roadway capacity and enhance traffic safety by removing parking maneuvers from public streets</p> <p>The parking demand attendant to the existing business would be eliminated</p>	<p>Would require the acquisition and displacement of Tom's Auto Body</p> <p>Owing to the nature of the business on this site, hazardous material clean-up may be required</p> <p>One of the objectives of the Downtown Development Plan adopted in 1993 was to "provide a greater orientation of the downtown area towards Lake Nagawica", including restoration of the old mill on Mill Street. The provision of parking on this site may be incompatible with that goal.</p> <p>Studies indicate that employees prefer to park as close to their place of employment as possible and, thus, incentives may be required to encourage employee use of the lot, particularly because employee parking is generally located at the furthest point in the lot</p> <p>The lack of a continuous sidewalk system within the central business district would require the construction of sidewalks between the site and Genesee Street to prevent the need for pedestrians and vehicles to share roadways which would result in a potential pedestrian safety problem and may act as a deterrent to the use of this lot</p>	\$76,000

Table 1 (Continued)

Potential Off-Street Parking Lot Sites (Shown in Figure 9)	Advantages	Disadvantages	Estimated Parking Lot Construction Cost
Mill (continued)		With the exception of Genesee Street, the current level of street lighting within the central business may act as a deterrent to the use of this lot after dark unless the lighting is improved	
Dela-Hart	<p>A surface lot could be constructed to provide approximately 94 parking stalls<sup>a</sup></p> <p>Would serve long-term employee parking demand and special event parking demand on the Lang Campus<sup>b</sup></p> <p>This lot could accommodate about 15 percent of the estimated 600 vehicle parking demand generated by special events on the Lang Campus</p> <p>Has the potential to reduce undesirable traffic circulation as motorists circle a block waiting for a parking space to become available</p> <p>Has the potential to preserve roadway capacity and enhance traffic safety by removing parking maneuvers from public streets</p> <p>No commercial or residential land uses would be displaced</p>	<p>Unlikely that this parking would be used for any purpose except Lang Campus employee parking or Lang Campus special events</p> <p>The primary beneficiary of this parking lot would be the Lang Campus; it would only benefit the City to the extent that it would satisfy some of the special event parking demand which would otherwise park elsewhere on City streets or in City parking lots</p> <p>The lack of sidewalks on Butler Street and the private roadway south of Wells Street would the construction of sidewalks between the site and Genesee Street to prevent the need for pedestrians and vehicles to share roadways which would result in a potential pedestrian safety problem and may act as a deterrent to the use of this lot</p> <p>With the exception of Genesee Street, the current level of street lighting within the central business may act as a deterrent to the use of this lot after dark unless the lighting is improved</p>	\$190,000

Table 1 (Continued)

Potential Off-Street Parking Lot Sites (Shown in Figure 9)	Advantages	Disadvantages	Estimated Parking Lot Construction Cost
Dopkins	<p>A surface lot could be constructed to provide approximately 135 parking stalls<sup>a</sup></p> <p>Would serve long-term employee parking demand within the central business district and the short-term customer parking demand generated by the commercial development in an area bounded by Milwaukee Street extended on the north, Genesee Street on the east including the area served by the proposed extension of Milwaukee Street and Dopkins Street; the Community Center and special event parking demand on the Lang Campus<sup>b</sup></p> <p>This lot could accommodate about 23 percent of the estimated 600 vehicle parking demand generated by special events on the Lang Campus</p> <p>Has the potential to reduce undesirable traffic circulation as motorists circle a block waiting for a parking space to become available</p> <p>Removes parking maneuvers from public streets thereby preserving roadway capacity and enhancing traffic safety</p> <p>Because of the difference in elevations between Wells Street and Main Street, it may be possible to construct a two level parking structure on this site without ramps in the structure itself</p> <p>Site may suitable for parking structure</p>	<p>Would require the acquisition and displacement of three residences. Assuming the extension of Butler Street between Wells Street and Main Street which would likely displace two residences, only three residences would remain in the block bounded by Wells Street, Dopkins Street and Main Street</p> <p>Studies indicate that employees prefer to park as close to their place of employment as possible and, thus, incentives may be required to encourage employee use of the lot, particularly because employee parking is generally located at the furthest point in the lot</p> <p>The lack of a continuous sidewalk system within the central business district would require pedestrians and vehicles to share some roadways resulting in a potential pedestrian safety problem and may act as a deterrent to the use of this lot</p> <p>With the exception of Genesee Street, the current level of street lighting within the central business may act as a deterrent to the use of this lot after dark unless the lighting is improved</p>	\$275,000
Main	<p>A surface lot could be constructed to provide approximately 110 parking stalls<sup>a</sup></p>	<p>Would require the acquisition and displacement of three residences.</p>	\$220,000

Table 1 (Continued)

Potential Off-Street Parking Lot Sites (Shown in Figure 9)	Advantages	Disadvantages	Estimated Parking Lot Construction Cost
Main (continued)	<p>Would serve long-term employee parking demand within the central business district and the short-term customer parking generated by the commercial development in an area bounded by Mill Street on the north, Dopkins Street on the west, and Division Street on the south<sup>b</sup></p> <p>Has the potential to reduce undesirable traffic circulation as motorists circle a block waiting for a parking space to become available</p> <p>Removes parking maneuvers from public streets thereby preserving roadway capacity and enhancing traffic safety</p> <p>Of the sites considered, this site is the most centrally located</p> <p>Site may be suitable for parking structure</p>	<p>Given its central location, a better use for this site may be commercial development</p> <p>Studies indicate that employees prefer to park as close to their place of employment as possible and, thus, incentives may be required to encourage employee use of the lot, particularly because employee parking is generally located at the furthest point in the lot</p> <p>The lack of a continuous sidewalk system within the central business district would require the construction of sidewalks between the site and Genesee Street to prevent the need for pedestrians and vehicles to share roadways which would result in a potential pedestrian safety problem and may act as a deterrent to the use of this lot</p> <p>With the exception of Genesee Street, the current level of street lighting within the central business may act as a deterrent to the use of this lot after dark unless the lighting is improved</p>	

<sup>a</sup> Assumes that 90 degree angle parking would be provided.

<sup>b</sup> A distance of 600 feet is generally considered the maximum distance that short-term parkers are willing to walk to their destinations. Short-term parking is that parking having a duration of two hours or less.

<sup>c</sup> Assumes that 90 degree angle parking would be provided in the lot in the southeast quadrant and 45 degree parking would be provided in the lot in the northeast quadrant of the Main Street and Oneida Street intersection.

<sup>d</sup> Assumes that 60 degree angle parking would be provided.

Source: SEWRPC

located to serve an area identified as the historic downtown core, the Mill site was not recommended because of its location at the northern fringe of the downtown, and because of potential hazardous material clean-up problems owing to the nature of the business currently on the site. The Oneida site was not recommended because of its location on the fringe of the downtown area, because the size of both parcels combined makes the provision of parking relatively inefficient, and because of potential hazardous material clean-up problems owing to the nature of the business currently on the site.

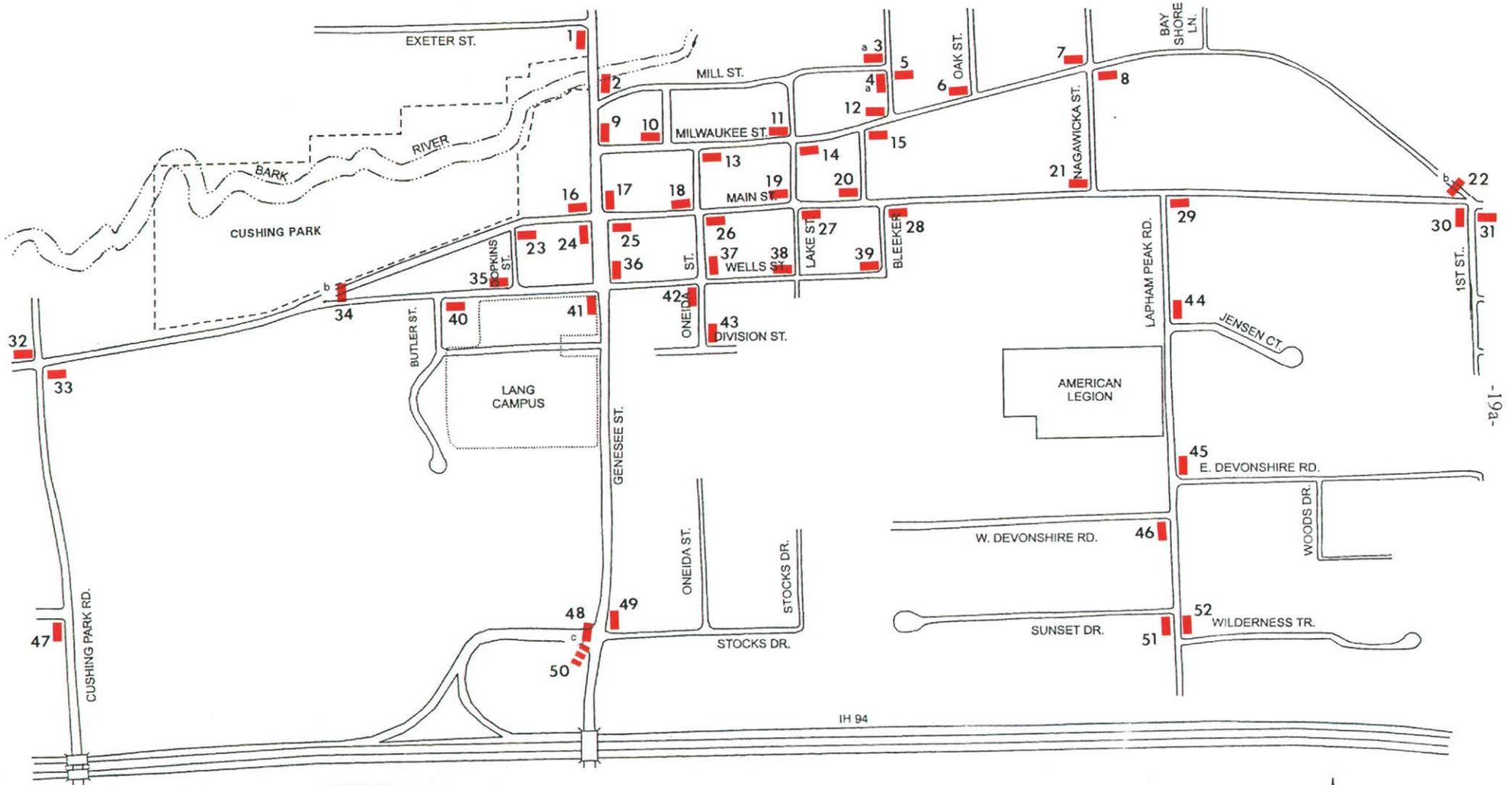
## TRAFFIC CONTROL

Travel on public streets and highways is controlled by traffic control devices which consist of signs, signals, markings and other such devices placed on or adjacent to the street or highway by authority of a public body or official having jurisdiction over the maintenance and operation of the various facilities. The purpose of traffic control devices is to help ensure highway safety by providing for the orderly and predictable movement of all traffic, both motorized and non-motorized, and to provide the necessary warnings and guidance to ensure the safe and uniform operation of individual elements of the traffic stream. In order to be effective, a traffic control device should meet five basic requirements: 1) fulfill a need; 2) command attention; 3) convey a clear, simple message; 4) command road user respect; and, 5) provide adequate time for the proper response.

Based upon an inventory of the traffic control devices within the study area conducted in 1998, the location of the existing traffic control signing at public street and highway intersections is shown in Figure 10. The sign type and sign message of the traffic control devices shown in Figure 10 are set forth in Table 2. The locations of pavement markings delineating pedestrian crosswalks are also shown in Figure 11. Pavement markings are also used to delineate the stop lines on all intersection approaches at the intersection of Genesee Street and Main Street, on the east- and westbound Wells Street approaches at its intersections with Genesee Street and Oneida Street, the eastbound Milwaukee Street approach at its intersection with Genesee Street, and the north- and southbound Oneida Street intersection approaches at Main Street and Milwaukee Street.

Figure 10

EXISTING TRAFFIC CONTROL DEVICES AT INTERSECTIONS IN THE STUDY AREA: 1997



LEGEND

- Stop Sign
- ▤▤▤ Yield Sign

<sup>a</sup> Regulatory signing posted with the stop sign indicates that right-turning vehicles on this approach are not required to stop.

<sup>b</sup> Regulatory signing posted with the stop sign indicates that oncoming traffic does not stop.

<sup>c</sup> The left turn and through movements on this approach are stop controlled; the right turn is yield controlled.

Note: The reference number shown in this Figure corresponds to the sign number in Table 2.

Source: SEWRPC

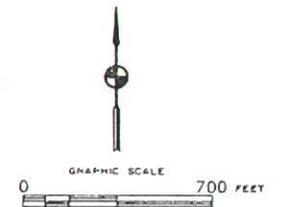


Table 2

EXISTING INTERSECTION TRAFFIC CONTROL DEVICES  
IN THE CITY OF DELAFILED STUDY AREA: 1997

Sign Number (Refer to Figure 10)	Sign Message	Sign Type	Street Approach Controlled by This Sign
1	Stop	Regulatory	Eastbound Exeter Street at Genesee Street (CTH C)
2	Stop	Regulatory	Westbound Mill Street at Genesee Street (CTH C)
3	Stop <sup>a</sup>	Regulatory	Southbound Bleeker Street at Mill Street
4	Stop <sup>a</sup>	Regulatory	Eastbound Mill Street at Bleeker Street
5	Stop	Regulatory	Northbound Bleeker Street at Mill Street
6	Stop	Regulatory	Southbound Oak Street at Milwaukee Street
7	Stop	Regulatory	Southbound Nagawicka Street at Milwaukee Street
8	Stop	Regulatory	Northbound Nagawicka Street at Milwaukee Street
9	Stop	Regulatory	Westbound Milwaukee Street Genesee Street (CTH C)
10	Stop	Regulatory	Southbound Oneida Street at Milwaukee Street
11	Stop	Regulatory	Southbound Lake Street at Milwaukee Street
12	Stop	Regulatory	Southbound Bleeker Street at Milwaukee Street
13	Stop	Regulatory	Northbound Oneida Street at Milwaukee Street
14	Stop	Regulatory	Northbound Lake Street at Milwaukee Street
15	Stop	Regulatory	Northbound Bleeker Street at Milwaukee Street
16	Stop	Regulatory	Southbound Genesee Street (CTH C) at Main Street
17	Stop	Regulatory	Westbound Main Street at Genesee Street (CTH C)
18	Stop	Regulatory	Southbound Oneida Street at Main Street
19	Stop	Regulatory	Southbound Lake Street at Main Street
20	Stop	Regulatory	Southbound Bleeker Street at Main Street
21	Stop	Regulatory	Southbound Nagawicka Street at Main Street
22	Stop <sup>b</sup>	Regulatory	Southeastbound Milwaukee Street at Main Street and 1st Street
23	Stop	Regulatory	Northbound Dopkins Street at Main Street
24	Stop	Regulatory	Eastbound Main Street at Genesee Street (CTH C)
25	Stop	Regulatory	Northbound Genesee Street at Main Street
26	Stop	Regulatory	Northbound Oneida Street at Main Street
27	Stop	Regulatory	Northbound Lake Street at Main Street
28	Stop	Regulatory	Northbound Bleeker Street at Main Street
29	Stop	Regulatory	Northbound Lapham Peak Road at Main Street
30	Stop	Regulatory	Eastbound Main Street at Milwaukee Street and 1st Street
31	Stop	Regulatory	Northbound 1st Street at Main Street and Milwaukee Street
32	Stop	Regulatory	Southbound Cushing Park Road at Main Street
33	Stop	Regulatory	Northbound Cushing Park Road at Main Street
34	Stop	Regulatory	WestBound Wells Street at Main Street

Table 2 (continued)

Sign Number (Refer to Figure 10)	Sign Message	Sign Type	Street Approach Controlled by This Sign
35	Stop	Regulatory	Southbound Dopkins Street at Wells Street
36	Stop	Regulatory	Westbound Wells Street at Genesee Street
37	Stop	Regulatory	Westbound Wells Street at Oneida Street
38	Stop	Regulatory	Southbound Lake Street at Wells Street
39	Stop	Regulatory	Southbound Bleeker Street at Wells Street
40	Stop	Regulatory	Northbound Butler Street at Wells Street
41	Stop	Regulatory	Eastbound Wells Street at Genesee Street
42	Stop	Regulatory	Eastbound Wells Street at Oneida Street
43	Stop	Regulatory	Westbound Division Street at Oneida Street
44	Stop	Regulatory	Westbound Jensen Court at Lapham Peak Road
45	Stop	Regulatory	Westbound E. Devonshire Road at Lapham Peak Road
46	Stop	Regulatory	Eastbound W. Devonshire Road at Lapham Peak Road
47	Stop	Regulatory	Eastbound Enterprise Drive at Cushing Park Road
48	Stop	Regulatory	Westbound IH 94 Off-ramp left-turn and through movements at Genesee Street
49	Stop	Regulatory	Westbound Stocks Drive at southbound Genesee Street
50	Yield	Regulatory	Westbound IH 94 Off-ramp right-turn movement at Genesee Street
51	Stop	Regulatory	Eastbound Sunset Drive at Lapham Peak Road
52	Stop	Regulatory	Westbound Wilderness Trail at Lapham Peak Road

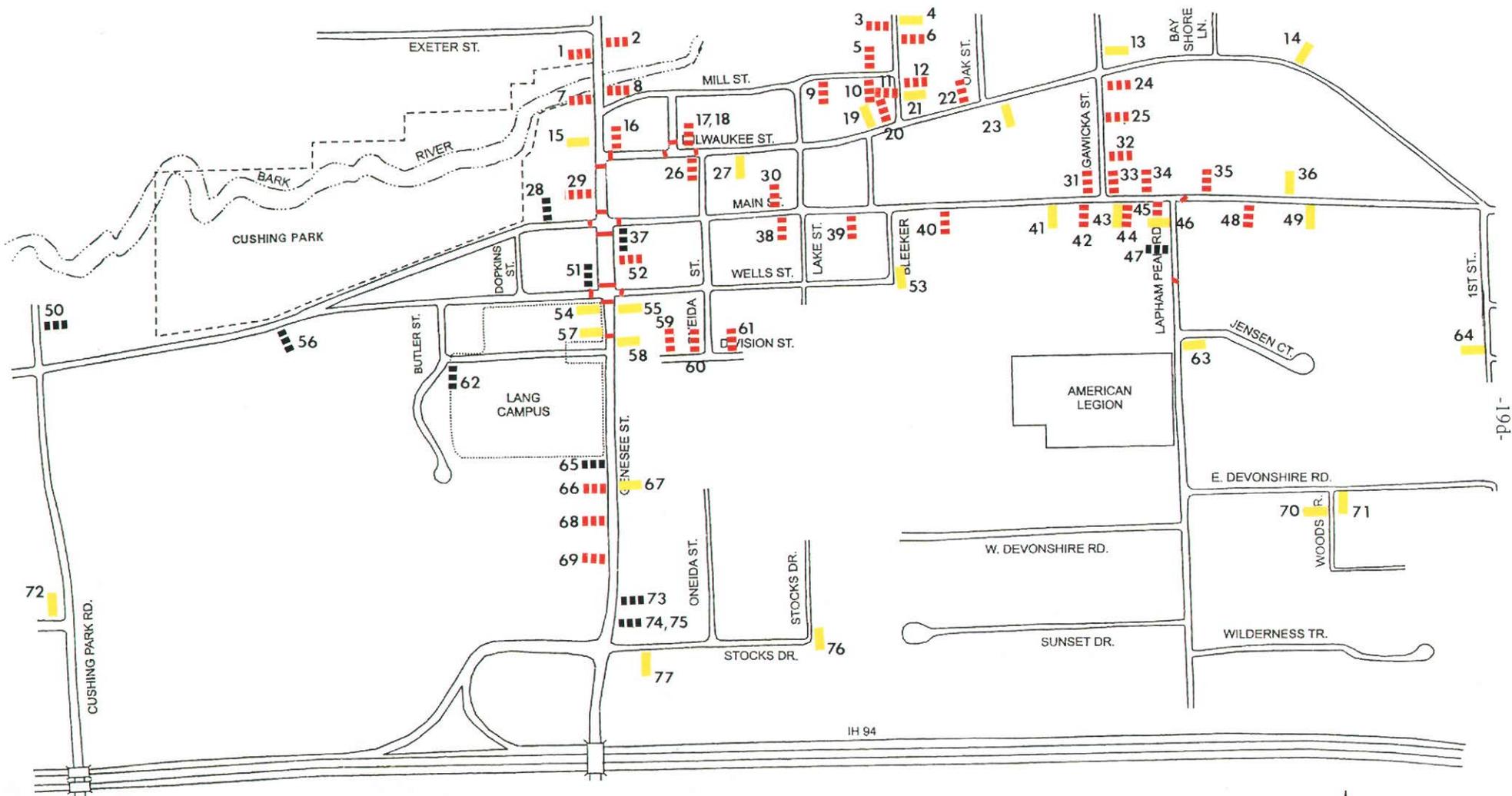
<sup>a</sup> Auxiliary regulatory signing indicates that right-turning vehicles on this approach are not required to stop.

<sup>b</sup> Auxiliary regulatory signing indicates that on-coming traffic does not stop.

Source: SEWRPC

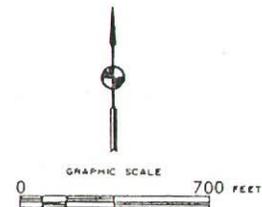
Figure 11

EXISTING NON-INTERSECTION TRAFFIC CONTROL DEVICES IN THE STUDY AREA: 1997



LEGEND

- Regulatory Signing - Parking
- Warning Signing
- Regulatory Signing - Miscellaneous
- Crosswalk Pavement Markings



The location of other traffic control devices within the study area, consisting of additional regulatory and warning signing is shown in Figure 11. The sign type and sign message of the traffic control devices shown in Figure 11 are set forth in Table 3. Finally, while the location of the speed limit regulatory signing is not shown in Figure 11, all streets and highways within the study area have a posted speed limit of 25 miles per hour except for Main Street west of its intersection with Wells Street and Cushing Park Road south of Main Street which are posted at 35 miles per hour.

#### Potential Traffic Control Deficiencies

The traffic management control criteria provided in Table 4 represent guidelines that can be used to evaluate the conformity of the existing traffic control to good traffic engineering practice within the study. These guidelines may also be utilized in the future to evaluate requests for the installation of new, or changes in existing traffic control devices. In addition to these traffic management control criteria, the design, physical placement, operation, maintenance, and uniformity of traffic control devices is governed by the Manual on Uniform Traffic Control Devices (MUTCD), promulgated by the U.S. Department of Transportation, Federal Highway Administration. The MUTCD also provides warrants for the installation of certain traffic control devices at arterial intersections, notably stop and yield signs and traffic signals.

Traffic control within the study area was generally found to conform to appropriate traffic engineering practices, criteria, standards and warrants. However, a number of existing signs were identified which have the potential to confuse motorists either through their location or their message, and thus may be considered deficient. In addition, City officials explicitly requested that the traffic control at the intersection of Genesee Street and Wells Street; the intersection of Main Street, Milwaukee Street, and 1st Street; and the intersection of Genesee Street and Exeter Street be evaluated.

Intersection of Genesee Street and Wells Street: This intersection is an intersection between Genesee Street, which is an arterial, and Wells Street, which is a land access street. As previously noted, arterial streets are ranked the highest within the functional classification hierarchy, and land access streets are ranked the lowest within that hierarchy. The guidelines set forth in Table 4

Table 3

EXISTING NON-INTERSECTION TRAFFIC CONTROL DEVICES  
IN THE CITY OF DELAFIELD STUDY AREA: 1997

Sign Number (Refer to Figure 11)	Sign Message	Sign Type	Sign Colors
1	No Parking Or Stopping	Regulatory	Red lettering on white background
2	No Parking Any Time	Regulatory	Red lettering on white background
3	No Parking	Regulatory	Red lettering on white background
4	Slow Children	Warning	Black lettering on yellow background
5	No Parking Any Time	Regulatory	Red lettering on white background
6	No Parking Any Time	Regulatory	Red lettering on white background
7	No Parking Any Time	Regulatory	Red lettering on white background
8	No Parking Any Time	Regulatory	Red lettering on white background
9	No Parking Any Time	Regulatory	Red lettering on white background
10	No Parking Any Time	Regulatory	Red lettering on white background
11	No Parking Any Time	Regulatory	Red lettering on white background
12	No Parking Any Time	Regulatory	Red lettering on white background
13	Dead End	Warning	Black lettering on yellow background
14	Large Arrow	Warning	Black pictograph on yellow background
15	Stop Ahead	Advance Warning	Black lettering on yellow background
16	No Parking Here To Corner	Regulatory	Red lettering on white background
17	No Parking Any Time	Regulatory	Red lettering on white background
18	No Parking Any Time	Regulatory	Red lettering on white background
19	Pedestrian Crosswalk	Warning	Black pictograph on yellow background
20	No Parking	Regulatory	Red lettering on white background
21	Slow Children At Play	Warning	Black lettering on yellow background
22	No Parking	Regulatory	Red lettering on white background
23	Slow Children At Play	Warning	Black lettering on yellow background
24	No Parking Any Time	Regulatory	Red lettering on white background
25	No Parking Any Time	Regulatory	Red lettering on white background
26	No Parking Any Time with arrow pointing east	Regulatory	Red lettering on white background
27	Pedestrian Crosswalk	Warning	Black pictograph on yellow background
28	No Thru Trucks Over 6 Tons	Regulatory	Black lettering on white background
29	No Parking Here To Corner	Regulatory	Red lettering on white background
30	No Parking Here To Corner with arrow pointing west	Regulatory	Red lettering on white background
31	No Parking Any Time	Regulatory	Red lettering on white background
32	No Parking	Regulatory	Red lettering on white background

Table 3 (continued)

Sign Number (Refer to Figure 11)	Sign Message	Sign Type	Sign Colors
33	No Parking Any Time	Regulatory	Red lettering on white background
34	No Parking Any Time	Regulatory	Red lettering on white background
35	No Parking Any Time	Regulatory	Red lettering on white background
36 <sup>a</sup>	Pedestrian Crosswalk	Warning	Black pictograph on yellow background
	Slow Children At Play	Warning	Black on yellow background
37	No Thru Trucks Over 6 Tons	Regulatory	Black lettering on white background
38	No Parking Here To Corner with arrow pointing east	Regulatory	Red lettering on white background
39	No Parking Any Time	Regulatory	Red lettering on white background
40	No Parking	Regulatory	Red lettering on white background
41	Slow Children At Play	Warning	Black lettering on yellow background
42	No Parking	Regulatory	Red lettering on white background
43	Pedestrian Crosswalk	Warning	Black pictograph on yellow background
44	No Parking Or Stopping	Regulatory	Red lettering on white background
45	No Parking Or Stopping	Regulatory	Red lettering on white background
46	Bicycle Crossing with Bike Xing plate	Advance Warning	Black pictograph and lettering on yellow background
47	No Thru Street	Regulatory	Black lettering on white background
48	No Parking	Regulatory	Red lettering on white background
49	Turn Sign	Advance Warning	Black pictograph on yellow background
50	5 Ton Bridge 1/4 Mile Ahead	Regulatory	Black lettering on white background
51	No Thru Trucks Over 6 Tons	Regulatory	Black lettering on white background
52	No Parking Here To Corner	Regulatory	Red lettering on white background
53	Turn Sign	Advance Warning	Black pictograph on yellow background
54	Fire Trucks Entering When Signal Flashing <sup>b</sup>	Advance Warning	Black lettering on yellow background
55	Stop Ahead	Advance Warning	Black lettering on yellow background
56	Reduce Speed Ahead	Regulatory	Black lettering on white background
57	Pedestrian Crosswalk	Warning	Black pictograph on yellow background
58	Pedestrian Crosswalk	Warning	Black pictograph on yellow background
59	No Parking Any Time	Regulatory	Red lettering on white background
60	No Parking Any Time	Regulatory	Red lettering on white background
61	No Parking Any Time	Regulatory	Red lettering on white background
62	No Thru Street	Regulatory	Black lettering on white background
63	Bicycle Crossing with Bike Xing plate	Advance Warning	Black pictograph and lettering on yellow background
64	Dead End	Warning	Black lettering on yellow background
65	School Speed Limit 15 When Children Are Present	Regulatory	Black lettering on white background <sup>c</sup>

Table 3 (continued)

Sign Number (Refer to Figure 11)	Sign Message	Sign Type	Sign Colors
66	No Parking Any Time	Regulatory	Red lettering on white background
67	Fire Trucks Entering When Signal Flashing <sup>b</sup>	Warning	Black lettering on yellow background
68	No Parking Any Time	Regulatory	Red lettering on white background
69	No Parking Any Time	Regulatory	Red lettering on white background
70	Dead End	Warning	Black lettering on yellow background
71	Dead End	Warning	Black lettering on yellow background
72	Dead End	Warning	Black lettering on yellow background
73	School Speed Limit 15 When Children Are Present	Regulatory	Black lettering on white background <sup>c</sup>
74	No Trailer Parking On All City Streets	Regulatory	Black lettering on white background
75	Parking Prohibited 2 A.M. - 6 A.M. Nov. 1 - May 1 All City Streets City of Delafield	Regulatory	Black lettering on white background
76	Large Arrow	Warning	Black pictograph on yellow background
77	Dead End	Warning	Black lettering on yellow background

<sup>a</sup> There are two warning signs mounted on the same post at this location.

<sup>b</sup> This sign is mounted on the same post as an amber signal head which flashes to alert motorists to watch for fire trucks entering the traffic stream.

<sup>c</sup> This sign is an assembly of multiple plates, all of which are black lettering on a white background except the topmost plate which has the word "School" in black on a yellow background.

Source: SEWRPC

Table 4

TRAFFIC MANAGEMENT CONTROL CRITERIA

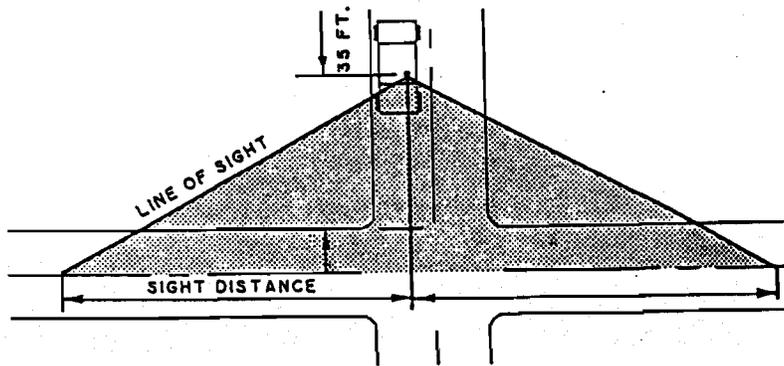
Traffic Control Category	Street and Highway System	Installation Warrants																
<p><b>Internal Traffic Control Warrants</b> Includes such traffic control devices as traffic signals, stop signs, yield signs, and pavement markings.</p>	<p>Arterial Streets and Highways<sup>1</sup></p>	<p>The installation of traffic control devices should conform with the warrants set forth in the <u>Manual on Uniform Traffic Control Devices</u><sup>2</sup> published by the U.S. Department of Transportation.</p>																
	<p>Non-Arterial Streets<sup>1</sup> (Collector and Land Access Streets)</p>	<p>The installation of traffic control devices should conform to the following warrants:</p> <table border="1" data-bbox="613 640 1489 1743"> <tr> <td data-bbox="613 640 948 693"></td> <td data-bbox="948 640 1489 693"> <p>Whenever a street intersects a higher order street in the street hierarchy, the street of lower order should be stop sign controlled.</p> </td> </tr> <tr> <td data-bbox="613 693 948 745"></td> <td data-bbox="948 693 1489 745"> <p>The intersection of two collector streets should be controlled with multi-way stop signs.</p> </td> </tr> <tr> <td colspan="2" data-bbox="613 745 1489 892"> <p>Each intersection of two land access streets should be analyzed primarily with regard to safety rather than convenience. Generally, intersection control in residential areas should appear reasonable and be designed to minimize conflicts and remove any doubt as to the establishment of rights-of-way. The assumed speed limit for this warrant is 25 miles per hour. Appropriate adjustments for this warrant must be made for higher posted speeds or when the known 85th percentile speed is 10 miles per hour greater than the posted speed. The installation of traffic control devices should conform to the following warrants:</p> </td> </tr> <tr> <td data-bbox="613 892 948 1092"></td> <td data-bbox="948 892 1489 1092"> <p>A two-way "Stop" control should be used to control two approaches at a four-legged intersection of two land access streets whenever one or more of the following conditions exist: the sight distances, as shown in the accompanying diagram, are equal to or less than 125 feet from the uncontrolled approaches; an accident problem evidenced by three or more accidents susceptible to correction by two-way stop control occurs in a 12-month period; or unusual geometrics or pedestrian or vehicle patterns suggest a need for positive control.</p> </td> </tr> <tr> <td data-bbox="613 1092 948 1207"></td> <td data-bbox="948 1092 1489 1207"> <p>Two-way "Yield" control may be used to control two approaches at a four-legged intersection where sight distance from the uncontrolled approach exceeds 125 feet, provided none of the other stop sign criteria are satisfied. Two-way yield at four-legged intersections should be used only when relatively low volumes of traffic occur.</p> </td> </tr> <tr> <td data-bbox="613 1207 948 1428"></td> <td data-bbox="948 1207 1489 1428"> <p>Although intersection control at a T-type intersection is generally limited to the approach on the stem of the T, special conditions may warrant consideration of controls on other approaches, when would require special studies. The criteria for placement of stop or yield controls for the stem of the T-type intersections should be the same as for a four-legged intersection. A decision to provide no control at a T-type intersection must represent a clear judgment that conditions are safe beyond reasonable doubt based upon a minimum sight distance of 200 feet on all approaches to the intersection, as well as a lack of an accident problem or geometric deficiencies.</p> </td> </tr> <tr> <td data-bbox="613 1428 948 1648"></td> <td data-bbox="948 1428 1489 1648"> <p>Multi-way stop controls should be considered only when roadways of equal character intersect and cannot operate at an acceptable level of safety with only one street controlled. Multi-way stops should be considered under the following conditions: a sight distance of 125 feet cannot be obtained for any approach when stop signs are placed on that approach; or evidence exists that a total of three or more accidents susceptible to correction by multi-way stop control have occurred within a 12-month period. Under both criteria, all less restrictive measures to obtain adequate sight distance or improve intersection safety are assumed to have been considered.</p> </td> </tr> <tr> <td data-bbox="613 1648 948 1743"></td> <td data-bbox="948 1648 1489 1743"> <p>No controls should be provided at intersections of two land access streets when a sight distance of 200 feet is provided on all approaches to the intersection, and provided none of the other stop or yield sign criteria are satisfied.</p> </td> </tr> </table>		<p>Whenever a street intersects a higher order street in the street hierarchy, the street of lower order should be stop sign controlled.</p>		<p>The intersection of two collector streets should be controlled with multi-way stop signs.</p>	<p>Each intersection of two land access streets should be analyzed primarily with regard to safety rather than convenience. Generally, intersection control in residential areas should appear reasonable and be designed to minimize conflicts and remove any doubt as to the establishment of rights-of-way. The assumed speed limit for this warrant is 25 miles per hour. Appropriate adjustments for this warrant must be made for higher posted speeds or when the known 85th percentile speed is 10 miles per hour greater than the posted speed. The installation of traffic control devices should conform to the following warrants:</p>			<p>A two-way "Stop" control should be used to control two approaches at a four-legged intersection of two land access streets whenever one or more of the following conditions exist: the sight distances, as shown in the accompanying diagram, are equal to or less than 125 feet from the uncontrolled approaches; an accident problem evidenced by three or more accidents susceptible to correction by two-way stop control occurs in a 12-month period; or unusual geometrics or pedestrian or vehicle patterns suggest a need for positive control.</p>		<p>Two-way "Yield" control may be used to control two approaches at a four-legged intersection where sight distance from the uncontrolled approach exceeds 125 feet, provided none of the other stop sign criteria are satisfied. Two-way yield at four-legged intersections should be used only when relatively low volumes of traffic occur.</p>		<p>Although intersection control at a T-type intersection is generally limited to the approach on the stem of the T, special conditions may warrant consideration of controls on other approaches, when would require special studies. The criteria for placement of stop or yield controls for the stem of the T-type intersections should be the same as for a four-legged intersection. A decision to provide no control at a T-type intersection must represent a clear judgment that conditions are safe beyond reasonable doubt based upon a minimum sight distance of 200 feet on all approaches to the intersection, as well as a lack of an accident problem or geometric deficiencies.</p>		<p>Multi-way stop controls should be considered only when roadways of equal character intersect and cannot operate at an acceptable level of safety with only one street controlled. Multi-way stops should be considered under the following conditions: a sight distance of 125 feet cannot be obtained for any approach when stop signs are placed on that approach; or evidence exists that a total of three or more accidents susceptible to correction by multi-way stop control have occurred within a 12-month period. Under both criteria, all less restrictive measures to obtain adequate sight distance or improve intersection safety are assumed to have been considered.</p>		<p>No controls should be provided at intersections of two land access streets when a sight distance of 200 feet is provided on all approaches to the intersection, and provided none of the other stop or yield sign criteria are satisfied.</p>
		<p>Whenever a street intersects a higher order street in the street hierarchy, the street of lower order should be stop sign controlled.</p>																
		<p>The intersection of two collector streets should be controlled with multi-way stop signs.</p>																
	<p>Each intersection of two land access streets should be analyzed primarily with regard to safety rather than convenience. Generally, intersection control in residential areas should appear reasonable and be designed to minimize conflicts and remove any doubt as to the establishment of rights-of-way. The assumed speed limit for this warrant is 25 miles per hour. Appropriate adjustments for this warrant must be made for higher posted speeds or when the known 85th percentile speed is 10 miles per hour greater than the posted speed. The installation of traffic control devices should conform to the following warrants:</p>																	
		<p>A two-way "Stop" control should be used to control two approaches at a four-legged intersection of two land access streets whenever one or more of the following conditions exist: the sight distances, as shown in the accompanying diagram, are equal to or less than 125 feet from the uncontrolled approaches; an accident problem evidenced by three or more accidents susceptible to correction by two-way stop control occurs in a 12-month period; or unusual geometrics or pedestrian or vehicle patterns suggest a need for positive control.</p>																
		<p>Two-way "Yield" control may be used to control two approaches at a four-legged intersection where sight distance from the uncontrolled approach exceeds 125 feet, provided none of the other stop sign criteria are satisfied. Two-way yield at four-legged intersections should be used only when relatively low volumes of traffic occur.</p>																
		<p>Although intersection control at a T-type intersection is generally limited to the approach on the stem of the T, special conditions may warrant consideration of controls on other approaches, when would require special studies. The criteria for placement of stop or yield controls for the stem of the T-type intersections should be the same as for a four-legged intersection. A decision to provide no control at a T-type intersection must represent a clear judgment that conditions are safe beyond reasonable doubt based upon a minimum sight distance of 200 feet on all approaches to the intersection, as well as a lack of an accident problem or geometric deficiencies.</p>																
		<p>Multi-way stop controls should be considered only when roadways of equal character intersect and cannot operate at an acceptable level of safety with only one street controlled. Multi-way stops should be considered under the following conditions: a sight distance of 125 feet cannot be obtained for any approach when stop signs are placed on that approach; or evidence exists that a total of three or more accidents susceptible to correction by multi-way stop control have occurred within a 12-month period. Under both criteria, all less restrictive measures to obtain adequate sight distance or improve intersection safety are assumed to have been considered.</p>																
		<p>No controls should be provided at intersections of two land access streets when a sight distance of 200 feet is provided on all approaches to the intersection, and provided none of the other stop or yield sign criteria are satisfied.</p>																
<p>Traffic stop signs should not be used for speed control. Studies have shown that this device does not reduce speeds and that the use of unwarranted devices breeds disregard for all traffic control devices and laws and, in many cases, may cause accident problems where no accident problem previously existed.</p>																		
<p>"Children-at-Play" signs attempting to warn motorists of normal conditions in residential areas should be discouraged. Children should not be encouraged to play within the street travelways. Children-at-Play signs serve as an open suggestion that this behavior is acceptable.</p>																		

Table 4 (continued)

Traffic Control Category	Street and Highway System	Installation Warrants
<p><b>Internal Traffic Control Warrants</b> (continued)</p>	<p>Non-Arterial Streets<sup>1</sup> (Collector and Land Access Streets) (continued)</p>	<p>Specific warnings for schools, playgrounds, parks, and other recreational facilities are available for use where clearly justified. These warnings should, according to the <u>Manual on Uniform Traffic Control Devices</u>, be based upon an engineering study, and be erected no less than 150 feet and no more than 700 feet in advance of the condition or location being drawn to the motorist's attention. Warning for school grounds or school crossing must be used in advance of every school crossing sign. It is important that a uniform approach to school area traffic controls be applied to assure a uniform behavior on the part of vehicle operations and pedestrians.</p> <p>Channelization to discourage through traffic and control vehicle speeds in residential areas includes such devices as roadway narrowings, traffic circles, and cul-de-sacs. Such devices should be used to preserve the integrity of the neighborhood while causing little inconvenience to the residents on the land access street to which they are applied, or to other residents in the neighborhood. These devices are not warranted on arterial facilities and should be applied only on collector and local access streets where identifiable conflicts exist between through and local traffic, or where excessive vehicle speeds are identified through observations or traffic accident patterns.</p> <p>Designation of one-way streets in residential areas should be used to discourage through traffic patterns on land access streets, reduce vehicular/pedestrian traffic conflicts, or reduce vehicle conflicts at an identified accident problem location. The designation of a one-way street should not have adverse traffic impacts on other land access streets or create circuitous and time-consuming travel for residents of the neighborhood or community.</p> <p>A residential parking permit program is a traffic control action designed to manage on-street vehicular parking in neighborhoods and to enhance the livability for the residents of those neighborhoods.</p>
<p><b>Peripheral Traffic Control Warrants</b> Peripheral traffic controls include turn prohibitions, one-way street designations, roadway diverters, and street closures. These controls are designed and used to divert through traffic from residential areas and to discourage "short-cutting" by motorists to avoid arterial street system congestion problems. These traffic control measures shall not be applied unless the volume of traffic on a land access street exceeds 200 vehicles per hour. Streets with peak-hour traffic volumes below 200 vehicles per hour are generally considered by residents as possessing desirable neighborhood amenities with minimum physical danger, noise, vibration, dust, and air pollution.</p>	<p>Non-Arterial Streets<sup>1</sup> (Collector and Land Access Streets)</p>	

<sup>1</sup> Within the study area, Genesee Street and Main Street are functionally classified as arterials, and Milwaukee Street, Lapham Peak Road, and Cushing Park road are functionally classified as collectors. The remaining streets within the study area are functionally classified as land access streets. The arterial streets are intended to carry the heaviest volumes of traffic, including all traffic traveling through the City of Defaield. Collector streets are intended to distribute traffic from the arterials to the land access streets, and to collect traffic from the land access streets for routing to the arterials. Land access streets are intended to provide direct access to abutting land development and provide for local traffic movement. Accordingly, traffic control devices should be installed on arterial and collector streets in such a manner as to encourage all through traffic to use arterials and to encourage all traffic between land access and arterial streets to use collector streets.

<sup>2</sup> U.S. Department of Transportation, Federal Highway Administration, "Warrants for the Installation of Traffic Signals and Stop and Yield Signs," Manual on Uniform Traffic Control Devices, 1988.



SIGHT DISTANCE DIAGRAM

recommend that the lower order street approaches only be controlled when streets with differing functional classifications intersect. Thus, the existing two-way stop control traffic control at this intersection conforms to those guidelines.

City officials, however, expressed concern about the delay incurred by motorists making left-turns from Wells Street at its intersection with Genesee Street due to heavy traffic volumes on Genesee Street. One alternative which was considered to reduce delay on the Wells Street approaches was a multi-way "Stop" sign installation. The installation of multi-way "Stop" sign control is warranted under the MUTCD if certain volume thresholds are met. or if five or more right- or left-turn collisions or right-angle collisions occur during a 12 month period.

The volume thresholds necessary for the installation of multi-way "Stop" sign control require that the total volume entering the intersection be a minimum of 500 vehicles per hour for at least eight hours, and the total units entering the intersection from the minor street--Wells Street--including vehicles and pedestrians, be a minimum of 200 per hour for the same eight hours. Accordingly, Commission staff conducted a manual turning movement count at this intersection to determine if a multi-way "Stop" sign installation was warranted. The total volume observed entering the intersection meets this volume threshold, but the total units entering the intersection from Wells Street were not observed to exceed 150 during any hour, and thus the minor street volume threshold is not met.

A review of the vehicular accident history for the three year period from December 1, 1994 through November 30, 1997 indicates that a total of five accidents occurred at this intersection, one in 1994, one in 1995, one in 1996, and two in 1997. Thus the traffic accident warrant for the installation of multi-way "Stop" sign control is not met, and it may be concluded that the existing traffic control is appropriate.

Intersection of Main Street, Milwaukee Street, and 1st Street: The intersection of Main Street, Milwaukee Street, and 1st Street is a four-legged intersection with two acute angles of intersection between roadway legs, one of approximately 48 degrees and one of approximately 42 degrees.

Motorists expect either two- or four-way "Stop" sign control at four-legged intersections in conformance with either the MUTCD or the traffic management criteria set forth in Table 4. Because of restricted sight distances in the southeast and northwest quadrants of this intersection, only the Milwaukee Street approach from the southeast is currently uncontrolled at this intersection. Each of the other three approaches is "Stop" sign controlled to abate the traffic safety problem caused by restricted sight distances exacerbated by the acute angles of intersection. The sight distance from 1st Street to the southeast is so restricted that a motorist stopped at the "Stop" sign cannot see traffic on the westbound Milwaukee Street approach.

The law governing the operation of motor vehicles requires that motorists stop at the stop sign and line controlling operations at an intersection and check for conflicting traffic. When sight distance is restricted from that position, the motorist must then advance, stop, and check for conflicting traffic repeating the process until an unrestricted sight distance is achieved and a determination safely made that no conflicting traffic is approaching the intersection. Because of the acute angle of intersection between the southern and southeastern inter-section legs and the sight distance restriction caused by the plant material in the southeast intersection quadrant, vehicles on 1st Street may be into the intersection before traffic from the southeast is visible. Further, vehicles approaching from the southeast on Milwaukee Street cannot see vehicles on the 1st Street approach. Therefore, not only do vehicles approaching from the southeast on Milwaukee Street represent a potential traffic accident hazard to 1st Street traffic, but vehicles from 1st Street turning left to Main Street or proceeding through the intersection to northwestbound Milwaukee Street represent a potential traffic accident hazard to vehicles approaching from the southeast on Milwaukee Street.

Three alternative actions were considered to abate the potential traffic safety problem resulting from the restricted sight distance in the northwest and southeast intersection quadrants at this intersection. The first alternative considered was to improve the sight vision triangle in the southeast "quadrant" of the intersection. This would entail removing plant material from an area bounded by: 1) the 1st Street east right-of-way line from its point of intersection with the southwest Milwaukee Street right-of-way line southerly for a distance of 35 feet to a point "A"; 2) the Milwaukee Street southwest right-of-way line from its point of intersection with the 1st Street east

right-of-way line southeast for a distance of 200 feet to a point "B"; and, 3) a line connecting points "A" and "B". The advantage of this alternative is that the vision triangles between Main Street, 1st Street, and the southeast leg of Milwaukee Street would be improved with an attendant improvement in traffic safety. The primary disadvantage of this alternative is that the sight distance between Main Street and the northwest leg of Milwaukee Street would remain severely restricted by a residential building. Another disadvantage of this alternative is that much of the plant material proposed to be removed is located on private property, and thus would require the voluntary cooperation of the property owner. Furthermore, the removal of this plant material would have a negative impact on roadside aesthetics. Nevertheless, because this alternative has the potential to improve traffic safety, it is recommended to be considered for implementation at an estimated cost of approximately \$500.

The second alternative considered was the installation of a "Stop" sign on the northwestbound Milwaukee Street intersection approach. The primary advantage of this alternative is that all vehicles would enter the intersection from a stopped position affording every motorist ample time to perceive and react to other vehicles with an attendant improvement in traffic safety. Another advantage is that the four-way stop control would generally be considered typical. However, under the traffic management guidelines set forth in Table 4, the arterial legs of this intersection should be uncontrolled and a four-way "Stop" sign control would generally be non-conforming. However, the "Stop" sign control on the eastbound Main Street approach cannot be removed because of the severely restricted sight distance between Main Street and southeastbound Milwaukee Street. Thus, in this situation, the four-way "Stop" control may be implemented for traffic safety purposes. The disadvantage of this alternative is that northwestbound motorists would incur delay at the intersection, although the increase in total delay at the intersection would be modest. It is, therefore, recommended that consideration be given to the installation of a "Stop" sign on the northwestbound Milwaukee Street approach to the intersection at an estimated cost of approximately \$200.

The third alternative considered was the conversion of 1st Street from two-way to one-way southbound operation. The primary advantage of this alternative is that no traffic would enter the

intersection from the 1st Street leg, and thus potential conflicts between traffic from this leg and traffic on the other intersection legs would be eliminated. Traffic safety would thereby be improved. The primary disadvantage would be the inconvenience and travel indirection imposed upon residents of 1st street, 2nd Street, and 3rd Street, and the diversion of traffic from 1st Street to 2nd Street and 3rd Street. Further, one-way operation should not be implemented except in pairs with specific facilities over which opposing directions of travel are routed, with logical termini for the one-way pairs operation available. Because 1st Street does not extend north of the subject intersection, the subject intersection may be considered a logical terminus on the north, but no such logical terminus exists on the south. Further, there is no parallel facility to serve as a one-way northbound roadway. Thus, this alternative is not recommended for implementation.

Intersection of Genesee Street (CTH C) and Exeter Street: Construction of a new U. S. Post Office was begun in 1997. The new Post Office is located in the southwest quadrant of the intersection of Genesee Street (CTH C) and Exeter Street and this prompted City officials to request that the existing traffic control at the intersection be evaluated. The evaluation indicated that the existing traffic control is currently appropriate for this intersection.

Once construction is completed, however, and operations are moved from the present Post Office site to the new location, northbound left turns into Exeter Street may be expected to increase significantly. Because Genesee Street (CTH C) at its intersection with Exeter Street has one 12 foot wide traffic lane in each direction and shoulders ranging from about one foot to about three feet in width, northbound left-turning vehicles awaiting a gap in the opposing traffic stream will block the northbound traffic lane, and delay northbound through traffic as well. Traffic on Exeter Street may experience delay as well, as motorists must await a gap of sufficient length to enter the Genesee Street traffic stream. Once trapped in a queue behind the lead vehicle, each motorist on Exeter Street must wait for the lead vehicle to enter the Genesee Street traffic stream before it can advance.

In order to minimize delay on all intersection approaches consideration should be given to the following geometric improvements. A left-turn bypass lane should be constructed adjacent to the northbound Genesee Street traffic lane to minimize delay to northbound through traffic, as shown

on Figure 12. A right-turn bypass lane should be constructed adjacent to the southbound Genesee Street traffic lane to minimize delay to southbound through traffic, also as shown on Figure 12. Construction of an exclusive right-turn lane on the eastbound intersection approach would have the potential to minimize delay on that approach as well. The provision of exclusive turn lanes not only has the potential to minimize delay, but to separate slow moving turning traffic from faster moving through traffic thereby improving traffic safety. Thus, it is recommended that consideration be given to reconstruction of the intersection to provide an exclusive northbound left-turn lane, and exclusive east- and southbound right-turn lanes. The cost to implement these improvements is estimated as \$125,000. Genesee Street (CTH C) is under the jurisdiction of Waukesha County at this intersection and thus no changes may be undertaken without the concurrence of County officials.

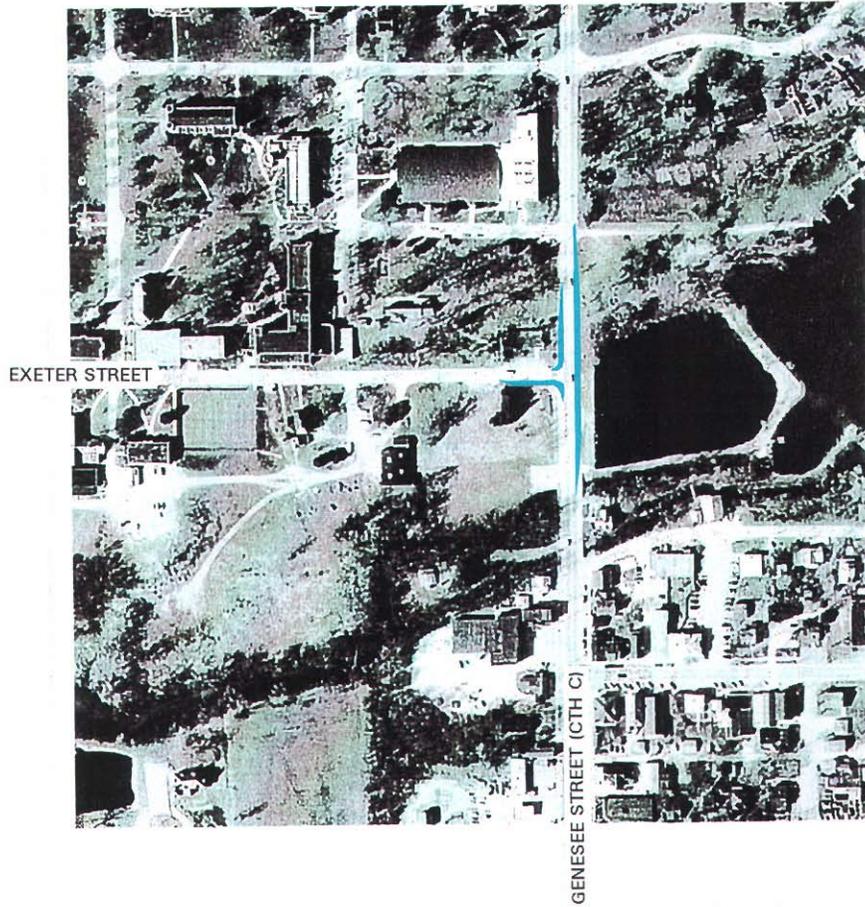
These physical changes would require appropriate pavement markings to delineate the exclusive lanes. If lane-use arrow pavement markings are provided in the exclusive turn lanes, the use of regulatory lane-use signs is required, and would be desirable in any case.

In order to preserve the roadway capacity of Genesee Street (CTH C), it is further recommended that access to and egress from the new Post Office only be permitted via Exeter Street. This would eliminate conflicts between the Genesee Street traffic stream and Post Office driveway traffic, and prevent delay to the northbound Genesee Street traffic stream caused by vehicles waiting to turn left into the driveway. The point of such access is recommended to be located as from the intersection of Genesee Street (CTH C) and Exeter Street as practicable.

Pedestrian Crosswalk Warning Signing: As shown on Figure 11, "Pedestrian Crosswalk" warning signs are posted at six locations within the study area. Each of these pictographic signs has two parallel horizontal lines with a stylized figure of a pedestrian shown between the lines. Under the MUTCD, the use of a stylized figure of a pedestrian with horizontal lines, is intended to convey the message that a pedestrian crosswalk is at that specific location immediately adjacent to the sign. "Pedestrian Crosswalk" warning signs should be posted in pairs at the crosswalk, one on each side of the roadway facing oncoming traffic. This signing is appropriately used at the crosswalk on

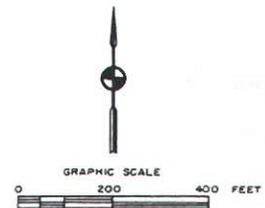
Figure 12

PROPOSED EXCLUSIVE TURN LANES AT THE INTERSECTION OF  
GENESEE STREET (CTH C) AND EXETER STREET IN THE CITY OF DELAFIELD



LEGEND

 Proposed Exclusive  
Turn Lanes



Source: SEWRPC

Genesee Street about 200 feet south of Wells Street as there is one sign on each side of the roadway facing oncoming traffic at a crosswalk delineated by pavement markings.

The intent of these signs at the other locations where "Pedestrian Crosswalk" signs are currently posted, is not as clear because each sign is posted without a companion sign for traffic in the opposite direction and several hundred feet separates signs on the same roadway. One of the four signs is posted at each of two different intersections and the other two are posted at different midblock locations, one facing eastbound traffic on Milwaukee Street east of Oneida Street and one facing westbound traffic on Main Street east of Lapham Peak Road. There is no apparent reason such as a school, park or other similar land use which would be expected to generate pedestrian traffic to warrant the midblock signs. Contrary to the practice recommended in the MUTCD, there are no crosswalk pavement markings to supplement the warning signs and to clearly delineate the location of the crosswalk for both pedestrians and motorists at either of the mid-block locations. Thus, because there is no nearby companion sign for traffic in the opposing direction, and because no crosswalk is delineated on the pavement adjacent to any of the four signs but particularly not adjacent to the signs posted at midblock, motorists may conclude that the signs are intended to provide advance warning of a crosswalk somewhere ahead, rather than announcing a crosswalk at that specific adjacent location.

In contrast to warning signs which are posted at the site of a condition, advance warning signs are posted ahead of a condition to alert motorists that they are approaching a location which requires attention and perhaps action on their part. The design differences between advance warning and warning signs are often subtle. In the case of pedestrian crosswalks the pictographic advance warning sign has only the stylized pedestrian figure, while the pictographic warning sign also has the two parallel lines. Therefore, because signs which are intended to provide advance warning actually display the pictograph indicating that a crosswalk is immediately adjacent, it may be concluded that the "Pedestrian Crosswalk" warning signs on Main Street and Milwaukee Street are being used inappropriately.

The action considered to ensure the appropriate signing for pedestrian crosswalks on Main Street

and Milwaukee Street was the replacement of the existing "Pedestrian Crosswalk" warning signs with "Pedestrian Crossing" advance warning signs and an auxiliary distance plate which specifies the distance between the sign and the pedestrian crossing. This action would provide motorists with advance warning of the pedestrian crossing and its relative location. These signs should be located approximately 200 feet in advance of the actual crosswalk location. It is recommended that the existing "Pedestrian Crosswalk" warning signs on east- and westbound Main Street and east- and westbound Milwaukee Street each be replaced with a "Pedestrian Crosswalk" advance warning sign and an auxiliary distance plate posted at a distance of about 200 feet from the pedestrian crossing. The cost to implement this alternative is estimated as \$600.

Turn Warning Signs: The "Turn" warning sign is intended to provide motorists with advance warning that they are approaching a sharp change in direction which is recommended to be negotiated at a speed of 30 miles per hour or less, but, in any case, at a speed less than the established speed limit. Two of these signs are posted within the study area as shown in Figure 11. The "Turn" warning sign on the east side of Bleeker Street facing eastbound Wells Street traffic provides no advance warning as it is posted at the location where the alignment change occurs. The motorist, based upon the 25 mile per hour posted speed limit of Wells Street, would expect that the turn itself was at a point about 150 to 200 feet east of its actual location. The "Turn" warning sign which faces eastbound traffic on Main Street is adjacent to a roadway segment which has no change in alignment until it enters the intersection of Main Street, Milwaukee Street and 1st Street about 850 feet east of the sign. Based upon the 25 mile per hour posted speed limit of Main Street, motorists would expect to encounter a sharp change in the roadway alignment approximately 150 to 200 feet east of the sign. Thus, it may be concluded that neither sign is appropriately posted.

The action considered at the intersection of Wells Street and Bleeker Street to ensure that the "Turn" warning sign is appropriately used was the relocation of the existing "Turn" warning sign at the intersection to a point, about 200 feet west of Bleeker Street adjacent to the south side Wells Street facing eastbound traffic. A "Large Arrow" sign should be posted at the existing location of the turn warning sign. This action would provide motorists with advance warning of the abrupt change in alignment ahead. The "Large Arrow" sign should be posted on the outside of an

alignment change to provide additional motorist guidance by indicating where the turn is located. The cost to implement this measure is estimated as \$200.

The corrective action considered with respect to the "Turn" warning sign posted adjacent to the south side of Main Street approximately 850 feet west of the Main Street, Milwaukee Street, and 1st Street intersection was its removal. This sign, which indicates an impending sharp change in alignment, is posted 850 feet ahead of any change in alignment which occurs on the east side of the Main Street, Milwaukee Street, and 1st Street intersection. Based upon the 25 miles per hour posted speed limit on Main Street, the MUTCD recommends that this sign be posted approximately 200 feet in advance of a change in alignment. Thus, motorists expect that they will have to reduce speed to negotiate a sharp change in roadway alignment shortly after passing the sign, but there is no change in alignment before motorists are required to stop at the intersection of Main Street, Milwaukee Street, and 1st Street. There is an alignment change between Main Street and Milwaukee Street east of the intersection but it is readily visible from the stop line. Because motorists must stop at the intersection, they are not required to decelerate to negotiate the alignment change concerned. The recommended action has a cost estimated as \$50.

No Through Trucks Signs: As shown on Figure 11, "No Through Trucks Over 6 Tons" regulatory signs are posted at three locations within the study area. These signs are also posted outside the study area on Main Street at the west corporate limit and on Milwaukee Street to the west of STH 83. There is no such prohibition posted on the recently completed Golf Road between STH 83 and Milwaukee Street. The intent of these signs is to prohibit the use of certain City streets by any truck weighing more than six tons to travel between the City's west corporate limit and Genesee Street or between Genesee Street and STH 83. Travel to intermediate locations is, however, permitted such that heavy trucks may serve the industrial park which abuts Cushing Park Road.

The practice of prohibiting through trucking on land access streets is typical; and, generally such trucking should be routed over arterials. The posting of Main Street, which is an arterial, to prohibit heavy truck traffic east of Genesee Street has the potential to divert such traffic either to Milwaukee Street or to Wells Street, neither of which is an arterial and neither of which is posted east of

Genesee Street. Thus, the existing regulatory signing concerned is atypical. Further, because IH 94 is located less than one-half mile south of Main Street and Milwaukee Street, providing uninterrupted travel at speeds of 65 miles per hour, it may be expected that there would be little incentive for heavy truck traffic to use local streets through the entire City.

Two alternative actions were considered to ensure the appropriate use of the no through trucks regulatory signing concerned. The first alternative action considered was the removal of the "No Thru Trucks Over 6 Tons" regulatory signing from Main Street. Main Street is an arterial street through the study area, and is the logical route for heavy truck traffic in the City. The primary advantage of this action is that through truck traffic would be discouraged from using land access and collector streets in the study area. Given the proximity of IH 94, it is anticipated that the volume of heavy trucks using City streets would be minimal. Therefore, it is recommended that the "No Thru Trucks Over 6 Tons" regulatory signing be removed from Main Street at an estimated cost of \$100.

The second alternative action considered was to post a "No Thru Trucks Over 6 Tons" regulatory sign facing eastbound traffic on Wells Street just east of its intersection with Main Street. The primary advantage of this alternative is that heavy through truck traffic would be prohibited from a land access street. Heavy trucks would use the Main Street and Genesee Street intersection which is four-way stop sign controlled making it easier for these vehicles to enter the Genesee Street traffic stream. It is recommended that this alternative be implemented at an estimated cost of \$150.

Stop Ahead Signs: As shown on Figure 11, there are two "Stop Ahead" advance warning signs posted within the study area. These signs are posted facing north- and southbound Genesee Street traffic approximately 350 feet in advance of the "Stop" signs on Genesee Street at its intersection with Main Street. There are intervening intersections at which the Genesee Street approaches are uncontrolled both north and south of the Genesee Street at Main Street intersection which are between the "Stop Ahead" advance warning signs and the "Stop" sign controlled Genesee Street approaches at the Main Street intersection. Confusion may be generated by this location of the advance warning signs because, typically, motorists would expect that they would be required to

stop at the first downstream intersection they encounter, not an unspecified intersection further downstream. Thus, it may be concluded that the location of these signs is inappropriate.

The corrective action considered was to move the signs concerned to a point about 200 feet in advance of the attendant stop sign. It is recommended that the stop ahead warning signs be relocated at an estimated cost of about \$150.

No Parking Signs: As shown on Figure 11, no parking regulatory signs are posted at various locations within the study area. These signs bear a number of messages including "No Parking Here To Corner", "No Parking At Anytime", and "No Parking". Although the sign messages are clear, with the exception of the signs having the message "No Parking Here To Corner", it is not clear as to where specifically the posted parking restrictions apply. Thus, it may be concluded that there may be motorist confusion over where parking is prohibited.

The corrective action considered to minimize motorist confusion over where parking is permitted was to replace the existing no parking regulatory signs with signs bearing the message "No Parking Any Time" and either a single-headed arrow pointing in the direction that the regulation is in effect, if the sign is at the end of a zone, or a double-headed arrow pointing both ways, if the sign is at an intermediate point in a zone. The advantage of this measure is to clearly delineate the no parking zones. It is recommended that this measure be implemented at an estimated cost of \$1,150.

Children At Play Signs: As shown on Figure 11, "Slow, Children-At-Play" warning signs are posted at a number of locations within the study area. Warning signs are intended to provide advance notice of unusual conditions ahead. Children at play is not an unusual condition, particularly in a residential neighborhood such as the one in the study area east of Genesee Street where these signs are posted. The guidelines set forth in Table 4 recommend that "Children-At-Play" signs attempting to warn motorists of normal residential neighborhood conditions should be discouraged. Children should be discouraged from playing in the street and children-at-play signs serve as a suggestion that such behavior is acceptable. Further, when not posted on every street, motorists may conclude that the absence of such signing indicates that there is no expectation that

children will be playing in the street become less vigilant. Therefore, it is recommended that the "Slow, Children-At-Play" warning signs be removed at an estimated cost of \$250.

No Thru Street Sign: There is a "No Thru Street" regulatory sign posted facing southbound traffic on the west side of Lapham Peak Road about 75 feet south of Main Street as shown on Figure 11. The intent of the "No Thru Street" sign is to restrict through traffic from certain roadway segments. Lapham Peak Road is, in effect, a dead end road as it currently provides the only access point for entry or egress to an area approximately one-quarter mile wide on both sides of Lapham Peak Road between Main Street and IH 94. Thus, even though the "No Thru Traffic" sign implies that it is possible for motorists to travel through the area, there is currently no alternative outlet, and it may be concluded that this sign is being inappropriately used.

The corrective action considered to inform motorists that Lapham Peak Road is, in effect, a dead end street was to replace the "No Thru Street" regulatory sign with a warning sign with the message "No Outlet". The advantage of this alternative is that motorists would be clearly warned that they are entering a street from which there is no alternative means of egress. It is recommended that the existing "No Thru Street" regulatory sign be replaced with a warning sign with the message "No Outlet" at an estimated cost of \$150.

#### Traffic Control Device Maintenance

All traffic control signing and pavement markings should be maintained on a routine periodic basis and those which are worn or faded should be replaced, and those which are no longer necessary or appropriate should be removed. One example of a sign which may be considered worn or faded is the large arrow warning sign posted on the north side of Milwaukee Street facing eastbound traffic about 300 feet east of Bay Shore Lane.

#### Conclusions and Recommendations

Traffic control within the study area was generally found to conform to appropriate criteria, standards and warrants. However, there are some existing signs which have the potential to cause confusion either through their placement or their message. In addition, three intersections were

specifically evaluated at the request of City officials to determine if changes in existing traffic control was warranted. These intersection include: Genesee Street at Wells Street; Main Street and Milwaukee Street at 1st Street; and Genesee Street at Exeter Street. Specific traffic control device recommendations are summarized in Table 5. Finally, a maintenance program which provides regular review and replacement of faded or worn signs is recommended.

### CUSHING ELEMENTARY SCHOOL DRIVEWAYS

City officials expressed concern about the difficulty which motorists experience when exiting the driveways at Cushing Elementary School during periods of snowy or icy weather owing to slippery conditions and the gradient of these driveways. Two driveways serve the school, intersecting Genesee Street from the west. One of the driveways is located about 450 feet north of Stocks Drive and the other is about 800 feet north of Stocks Drive. The southern driveway has a gradient of about 14 percent and the northern driveway has a gradient of about 8 percent. The driveway gradients compare to a gradient of about 5.5 percent on Genesee Street between Cushing Elementary School and Wells Street.

These gradients, while steep, are also relatively short having a length of about 50 feet and, therefore, generally should not pose a problem. However, because motorists must stop on the grade to await a gap in the Genesee Street traffic stream, the loss of traction attendant to snow or ice cover impedes a motorist's ability to accelerate quickly and smoothly from the stopped condition. If motorists do not allow extra time and await gaps in the Genesee Street traffic stream which are longer than they usually allow, a potential traffic safety problem results because the vehicle has only partially exited the driveway and entered the traffic stream. While this is only an intermittent problem, because exiting vehicles would likely be multi-occupant vehicles, the potential exists for accidents with multiple injuries. Thus, it is reasonable to consider alternative actions to address the potential traffic safety problem attendant to slippery conditions on the driveways at Cushing Elementary School.

Three alternatives were considered to address the potential traffic safety problem attendant to

Table 5

RECOMMENDED ACTIONS TO ADDRESS THE TRAFFIC CONTROL DEFICIENCIES  
IDENTIFIED IN THE STUDY AREA IN THE CITY OF DELAFIELD: 1997

Traffic Control Deficiency	Recommended Action	Advantages	Disadvantages	Estimated Cost
Restricted intersection sight distance at Main Street, Milwaukee Street, and 1st Street intersection	Improve vision triangle in the southeast quadrant	The larger vision triangle improves sight distance and traffic safety at the intersection	Sight distance in the northwest intersection quadrant remains severely restricted  Requires voluntary cooperation of property owner Degrades roadside aesthetics	\$500
	Convert existing three-way stop to four-way stop by installing stop sign control on the northwestbound Milwaukee Street approach	Improve traffic safety at the intersection  Convert atypical existing three-way stop sign control to typical four-way stop sign control	Modest increase in delay incurred by northwestbound vehicles	\$200
Increased delay incurred attendant to increase in traffic volumes generated by construction of new post office in the southwest quadrant of the Genesee Street (CTH C) and Exeter Street intersection	Provide exclusive northbound left-turn lane, and exclusive east- and southbound right turn lanes <sup>a</sup>	Minimize delay to traffic traveling through the intersection  Improve traffic safety by separating vehicles decelerating or stopped to execute a turn maneuver from the through traffic	Genesee Street (CTH C) is under the jurisdiction of Waukesha County at this intersection. Thus, County officials must concur with any changes in the intersection geometry and traffic control before it can be implemented  The cost of implementation	\$125,000
	Restrict post office access and egress to Exeter Street	Preserve capacity of Genesee Street by eliminating potential conflicts between Genesee Street traffic and the post office driveway traffic; and prevent delay to the Genesee Street traffic stream caused by vehicles waiting to turn into the driveway	There is no disadvantage	--

Table 5 (continued)

Traffic Control Deficiency	Recommended Action	Advantages	Disadvantages	Estimated Cost
Inappropriate use of "Pedestrian Crosswalk" warning signing	Replace the existing "Pedestrian Crosswalk" warning signs on Main Street and Milwaukee Street with Pedestrian Crosswalk advance warning signs and an auxiliary distance plate	Provide motorists with advance warning of the crosswalk and the crosswalk location relative to the signing	There is no disadvantage	\$600
Inappropriate use of "Turn" warning signing	Relocate existing "Turn" warning sign located at the intersection of Bleeker Street and Wells Street to a point about 200 feet west of the intersection on the south side of Wells Street facing eastbound traffic, and install a "Large Arrow" warning sign.	Provides advance warning of the abrupt alignment change ahead which requires the motorist to decelerate to a slower speed to safely negotiate the turn, and notice of the location of the turn.		\$200
	Remove the "Turn" warning sign which is posted on the south side of Main Street about 850 feet west of its intersection with Milwaukee Street and 1st Street	The change in alignment is readily visible from the Main Street stop line at the intersection of Main Street, Milwaukee Street and 1st Street which is the location of the alignment change. Because motorists are proceeding from a stopped position they do not have to decelerate to negotiate the turn. Thus, the sign is not necessary.	There is no disadvantage	\$50
Inappropriate use of "No Thru Trucks Over 6 Tons" regulatory signing	Remove the "No Thru Trucks Over 6 Tons" regulatory signing from arterial facilities within the City	Discourages use of collector and land access streets by heavy trucks	Permits use of local arterial streets by heavy trucks which has the potential to result in pavement damage.	\$100
	Post "No Thru Trucks Over 6 Tons" regulatory signing on Wells Street just east of its intersection with Main Street	Prohibits heavy through trucks from land access street	There is no disadvantage	\$150

Table 5 (continued)

Traffic Control Deficiency	Recommended Action	Advantages	Disadvantages	Estimated Cost
Inappropriate location of "Stop Sign Ahead" advance warning signing	Relocate the existing signing to a point approximately 200 feet in advance of the stop signs	Eliminates potential motorist confusion caused by an intersection with uncontrolled approaches between "Stop Ahead" advance warning signing and the stop signs	There is no disadvantage.	\$150
Unclear "No Parking" regulatory signing <sup>a</sup>	Replace existing "No Parking" Regulatory signing with "No Parking" signing which has a single-headed arrow pointing in the direction that parking is regulated when the sign is at the end of a zone, or a double-headed arrow pointing both ways when the sign is at an intermediate point in a zone <sup>b</sup>	Clearly delineate no parking zones thereby eliminating any motorists confusion with respect which roadway segments have parking prohibited	There is no disadvantage	\$1,150
Inappropriate "Slow Children At Play" warning signs	Remove existing "Slow Children At Play" warning signs	Where posted, these warning signs serve as a suggestion that playing in the street is acceptable behavior, a practice which should be discouraged  Warning signs are intended to alert motorists to unusual conditions. Children playing is not an unusual condition.	There is no disadvantage	\$250
Inappropriate "No Thru Street" regulatory sign	Replace existing "No Thru Street" regulatory sign with a "No Outlet" warning sign	Clearly warns motorists that they are entering a street from which there is no alternative means of egress.	There is no disadvantage	\$150
<b>Total</b>				<b>\$128,500</b>

-32c-

<sup>a</sup> The "No Parking" regulatory signing message may read "No Parking" or "No Parking Any Time", but neither is clear as to the precise zone where parking is prohibited.

<sup>b</sup> The "No Parking" regulatory signing message may read "No Parking" or "No Parking Any Time", but must have an arrow to clearly define the precise zone

Table 5 (continued)

where parking is prohibited. This action may also require the posting of additional regulatory "No Parking" signing at intermediate locations if the no parking zone is unusually long.

Source: SEWRPC

slippery conditions on the driveways at Cushing Elementary School, including: 1) lowering the elevation of Genesee Street in the vicinity of the school to reduce the driveway gradient; 2) driveway reconstruction to decrease the gradient; and, 3) increased snow and ice control. Consideration of the first alternative, lowering the existing elevation of Genesee Street in the vicinity of Cushing Elementary School, was specifically requested by City officials. Because the existing driveways are about 50 feet in length, a 0.5 foot change in the elevation of Genesee Street would result in approximately a 1 percent change in the driveway gradient. Thus, to have a significant impact on the driveway gradient, the elevation of Genesee Street would have to be lowered at least two feet. Lowering the elevation of Genesee Street by two feet would result in a driveway gradient of about 10 percent at the southern driveway and about 4 percent at the northern driveway. This change in elevation on Genesee Street would have a detrimental impact on driveways intersecting Genesee Street from the east in the vicinity of the school by increasing the attendant gradients in the range of 2 to 3 percent, and would provide only marginal improvement at the southern school driveway. The cost of this alternative is estimated at approximately \$350,000. This alternative was not recommended for implementation because of the detrimental impact on other driveways intersecting Genesee Street, the marginal improvement at the southern school driveway, and the estimated cost.

The second alternative considered to address the potential traffic safety problem attendant to slippery conditions on the driveways at Cushing Elementary School was driveway reconstruction. Reconstruction at the northern driveway would include lengthening the driveway from 50 to about 200 feet, and relocating it about 75 feet to the north to achieve about a 4 percent gradient. This would necessitate reconstruction of a significant portion of the existing parking lot. Given the gradient of the southern driveway and its western termination at an internal circulation roadway which abuts the school building, physical changes to this driveway appear to be very difficult, if not impractical, owing to the attendant detrimental impact on existing storm water drainage patterns. Thus, reconstruction of the southern driveway is not recommended. The cost to reconstruct the northern driveway is estimated at approximately \$165,000. This alternative was not recommended to be implemented because of the cost.

The third alternative considered to address the problems concerned and to improve traffic safety would not physically modify either driveway but would provide increased snow and ice control operations necessary to ensure proper traction on the existing driveways. There would be no capital cost associated with this alternative, but there would be on-going maintenance costs ranging between \$25 and \$50 per control operation depending upon the severity and nature of the snow or ice event. It is recommended that the City encourage school district officials to provide the necessary increased snow and ice control operations to ensure proper traction on the existing driveways.

## SUMMARY

At the request of the City of Delafield, the Regional Planning Commission staff conducted a review of the need for potential local collector and land access street roadway extensions, as well as a review of existing parking and traffic control on those streets in the core area of the City. The core area is generally bounded on the north by Exeter Street and Lake Nagawicka, on the east by First Street, on the south by IH 94, and on the west by Cushing Park Road.

In order to address the issues of concern, particularly potential street extensions and traffic control, it was necessary to establish the functional and jurisdictional classification of the existing streets and highways in the study area. The following facilities may be currently classified as arterials: IH 94 between Cushing Park Road and Lapham Peak Road; Genesee Street between Main Street and IH 94; Genesee Street (CTH C) between the Bark River and Main Street; Main Street between Cushing Park Road and 1st Street; and Milwaukee Street east of Main Street. Within the study area, Lapham Peak Road from Main Street to its terminus just south of Wilderness Trail; Milwaukee Street from Genesee Street (CTH C) to Main Street; and Cushing Park Road between Main Street and IH 94 may be currently classified as collector streets, and the remaining streets may be currently classified as land access streets.

All streets and highways within the study area are under the jurisdiction of the City of Delafield with the exception of IH 94 from the west study limit to the east study limit, which is under the

jurisdiction of the Wisconsin Department of Transportation, and the segment of Genesee Street (CTH C) between Exeter Street and Main Street, which is under the jurisdiction of Waukesha County. Thus, the City would be responsible for implementing any street extensions within the study area, although any extension which intersects the segment of Genesee Road under the jurisdiction of Waukesha County would require the approval of the County with respect to the design of the intersecting roadway and the intersection traffic control.

City officials requested that four potential street extensions be evaluated under this study: 1) Dopkins Street northerly from its intersection with Main Street to Milwaukee Street extended, and Milwaukee Street westerly from its intersection with Genesee Street (CTH C) to an extended Dopkins Street; 2) Butler Street northerly from Wells Street to Main Street; 3) Stocks Drive northerly from its current terminus to Lake Street; and 4) a new east-west facility between Lapham Peak Road and Genesee Street opposite the Genesee Street entrance to the Lang Campus.

The first two street extensions identified by the City would serve lands which are planned to be redeveloped, while the last two would serve lands which are currently undeveloped. The recommendations of the Regional Planning Commission staff with respect to these street extensions are set forth in Table 6.

City officials requested that the existing parking in the central business district be reviewed. In December 1997, there was a total of about 292 public parking spaces within the area as shown in Figure 8 of this report. About 240 of the public parking spaces, or about 82 percent, were on-street parking spaces; and 52, or 18 percent, were off-street public parking spaces. Of the 240 on-street parking spaces, about 148 spaces, or about 62 percent, were angle parking spaces, with the remaining 92 spaces, or 38 percent, being parallel parking spaces. Commission staff observations indicated that the supply of public on-street and off-street parking spaces available was generally adequate to meet the current average weekday parking demand; that is, less than 85 percent of all on-street parking spaces were observed to be occupied at any time.

It may be anticipated, however, that as development densities increase in the central business

Table 6

RECOMMENDATIONS WITH RESPECT TO PROPOSED STREET EXTENSIONS IN THE STUDY AREA IN THE CITY OF DELAFIELD: 1997

Issue	Proposal	Recommended Action	Comments <sup>a</sup>
STREET EXTENSIONS	Proposed Extension of Dopkins Street and Milwaukee Street	Extend Dopkins Street and Milwaukee Street	This extension of Dopkins Street may be considered, but the proposed extension would be through park lands which may require: 1) Wisconsin Department of Natural Resources approval; and 2) replacement of the lands converted to non-outdoor recreational uses with other lands of similar area, and recreational and economic value which are not currently under public ownership. <sup>b</sup>
		Extend Milwaukee Street if Dopkins Street cannot be extended	This extension would require construction of a cul de sac at the west end of the street extension.
	Proposed Extension of Butler Street	Extend Butler Street	Because the due northerly extension of Butler Street would displace two residences, other less disruptive alternatives for the proposed extension may be considered.
	Proposed Extension of Stocks Drive and a new East-West Facility Between Lapham Peak Road and Genesee Street	Extend Stocks Drive but do not construct the East-West facility from Lapham Peak Road to Genesee Street	The extension of Stocks Drive would not result in any new arterial or collector street intersections. The construction of a new east-west facility would result in a new arterial and a new collector street intersection. <sup>c</sup>
		Undertake to have a neighborhood development plan prepared for the area which the Stocks Drive and the new east-west facility would traverse.	The plan would recommend a development pattern to meet land use development, traffic circulation, storm water drainage, sanitary sewer and water supply needs.  The plan would serve as a point of departure for development decision-making subject to improvement as conditions change.

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<sup>a</sup>A more detailed description of each recommended action including the advantages and disadvantages of each action is set forth in the "PROPOSED NEW STREETS OR STREET EXTENSIONS" section of the report.

Table 6 (continued)

<sup>b</sup>While recognizing that the Wisconsin Department of Natural Resources has taken the position that the existing park lands must remain in public recreational uses, the City staff believes that the potential exists to use these lands for other public purposes without satisfying the requirements outlined here.

<sup>c</sup>Should the City determine that higher density residential development than envisioned under the 2020 regional land use plan or that additional commercial development along Genesee Street between Stocks Drive and Wells Street is desirable for this neighborhood, consideration may be given to constructing an east-west facility to facilitate intra-community access to and egress from the neighborhood.

Source: SEWRPC

district as recommended in the City's Downtown Development Plan, the demand for additional parking will increase. Furthermore, special events sponsored by the Lang Company may create parking demand during those events well in excess of the existing supply within the City's central business district. Thus, it may be concluded that additional parking may be needed within the City's central business district.

The City Downtown Development Plan prepared in 1993 recommended the provision of additional on-street on Oneida Street, Milwaukee Street and its extension, and Dopkins Street and its extension and identified four potential sites for the provision of additional off-street parking spaces. These sites are shown on Figure 9, and included sites identified as: 1) "Community"; 2) "Municipal"; 3) "Oneida"; and, 4) "Mill". The Commission staff identified three additional potential sites for the provision of off-street parking which are also shown on Figure 9 and include sites identified as: 1) "Dela-Hart"; 2) "Dopkins"; and, 3) "Main". The Commission staff recommendations with respect to the provision of additional on-street and off-street parking are summarized in Table 7.

City officials also requested that the existing traffic control within the study area be reviewed. An inventory of the traffic control devices within the study area conducted in 1998 which included the existing traffic control signing and pavement markings. This inventory is summarized in Figures 10 and 11, and in Tables 2 and 3 of this report. The existing traffic control devices were compared to accepted traffic engineering guidelines and warrants to identify potential deficiencies. Following the identification of potential deficiencies, alternative actions to address the deficiencies were identified and evaluated, and selected actions were recommended by the Commission staff for implementation. The Commission staff traffic control recommendations are summarized in Table 8.

Finally, City officials also requested that a proposal to lower elevation of Genesee Street in the vicinity of Cushing Elementary School to address slippery driveway conditions when exiting from the parking lot during snowy and icy weather be reviewed. The Commission staff did not recommend changing the elevation of Genesee Street because lowering the elevation would have a

Table 7

PUBLIC ON-STREET AND OFF-STREET PARKING RECOMMENDATIONS IN THE STUDY AREA IN THE CITY OF DELAFIELD: 1997

Issue	Proposal	Recommended Action	Comments <sup>a</sup>
<b>PUBLIC PARKING</b>			
	The provision of additional on-street parking on Dopkins Street, Milwaukee Street, and Oneida Street was recommended in the City's downtown development plan. <sup>a</sup>	Provide additional on-street parallel parking on Dopkins Street, Milwaukee Street, and Oneida Street	Additional parking should be provided only when these facilities require reconstruction to accommodate increased development densities or when the existing pavements reach the end of their useful lives. Convert existing angle parking on these facilities to parallel parking at the time of reconstruction to enhance traffic movement and traffic safety.
		Provide parallel parking only on-street, including the conversion of existing angle parking on Genesee Street and Main Street to parallel parking	Angle parking is not recommended for on-street parking because of the potential safety hazard it represents.
		Provide parallel on-street parking on both sides of the Dopkins Street and the Milwaukee Street extensions if implemented.	Provides additional parking in the central business district serving abutting development.
	The provision of additional off-street parking was recommended in the City's downtown development plan. <sup>b</sup>	Four sites were recommended for consideration for the provision of off-street parking: Dela-hart, Dopkins, Main, and Municipal as shown in Figure 9. <sup>c,d</sup>	The off-street parking stalls would address the increased parking demand expected as a result of redevelopment in the central business district and provide additional parking for the special events sponsored by the Lang Company.

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<sup>a</sup>A more detailed description of each recommended action including the advantages and disadvantages of each action is set forth in the "PUBLIC PARKING" section of the report.

<sup>b</sup>See "Downtown Development Plan, Delafield, Wisconsin", Discovery Group, Ltd. August 1993.

Figure 9 is in the "PUBLIC PARKING" section of the text.

<sup>d</sup>The Community lot site was not recommended because it would involve the conversion of existing park lands to non-recreational uses, and the Wisconsin Department of Natural Resources has taken the position that the subject lands must remain in public recreational uses. It may be noted, however, that the City staff believes there is potential to use these lands for non-recreational public purposes.

Source: SEWRPC

Table 8

RECOMMENDED TRAFFIC CONTROL DEVICE MODIFICATIONS IN THE STUDY AREA IN THE CITY OF DELAFIELD: 1997

Issue	Deficiency	Recommended Action	Comments <sup>a</sup>
TRAFFIC CONTROL DEVICES			
	Restricted intersection sight distance at Main Street, Milwaukee Street, and 1st Street intersection.	Improve vision triangle in the south-east quadrant.	The recommended larger vision triangle would improve sight distance and traffic safety at the intersection.
		Convert existing three-way stop to four-way stop by installing stop sign control on the northwest bound Milwaukee Street approach.	The recommendation would improve traffic safety at the intersection by converting an atypical existing three-way stop sign control to a typical four-way stop sign control.
	Increased delay incurred attendant to increase in traffic volumes generated by construction of new Post Office in the southwest quadrant of the Genesee Street (CTH C) and Exeter Street intersection.	Provide exclusive northbound left-turn lane, and exclusive east- and south-bound right turn lanes <sup>a</sup> .	<p>The existing traffic control was found to conform to the guidelines set forth in Table 4. The provision of exclusive turn lanes as recommended would require new pavement markings and may require additional traffic control signing.</p> <p>The recommendations would minimize delay to traffic traveling through the intersection; and would improve traffic safety by separating vehicles decelerating or stopped to execute a turn maneuver from the through traffic.</p>
		Restrict Post Office access and Egress to Exeter Street.	This recommendation would preserve the capacity of Genesee Street by eliminating potential conflicts between Genesee Street traffic and the Post Office driveway traffic; and prevent delay to the Genesee Street traffic stream caused by vehicles waiting to turn into the driveway.

Table 8 (Continued)

Issue	Deficiency	Recommended Action	Comments <sup>a</sup>
<p>TRAFFIC CONTROL DEVICES (Continued)</p>	<p>Inappropriate use of "Pedestrian Crosswalk" warning signing.</p>	<p>Replace the existing "Pedestrian Crosswalk" warning signs Main Street and Milwaukee Street with Pedestrian Crosswalk advance warning signs and an auxiliary distance plate.</p>	<p>The recommendation would provide motorists with advance warning of the crosswalk and the crosswalk location relative to the signing.</p>
	<p>Inappropriate use of "Turn" warning signing.</p>	<p>Relocate existing "Turn" warning sign located at the intersection of Bleeker Street and Wells Street to a point about 200 feet west of the intersection on the south side of Wells Street facing eastbound traffic, and install a "Large Arrow" warning sign.</p>	<p>This recommendation would provide advance warning of the abrupt alignment change ahead which requires the motorist to decelerate to a slower speed to safely negotiate the turn, and notice of the location of the turn.</p>
		<p>Remove the "Turn" warning sign Which is posted on the south side of Main Street about 850 feet west of its intersection with Milwaukee Street and 1st Street.</p>	<p>The change in alignment is readily visible from the Main Street stop line at the intersection of Main Street, Milwaukee Street and 1st Street which is the location of the alignment change. Because motorists are proceeding from a stopped position they do not have to decelerate to negotiate the turn. Thus, the sign is not necessary.</p>
	<p>Inappropriate use of "No Thru Trucks Over 6 Tons" regulatory signing.</p>	<p>Remove the "No Thru Trucks Over 6 Tons" regulatory signing from arterial facilities within the City.</p>	<p>The signing encourages use of collector and land access streets by heavy trucks.</p>
		<p>Post "No Thru Trucks Over 6 Tons" Regulatory signing on Wells Street just east of its intersection with Main Street.</p>	<p>The recommendation would prohibit heavy through trucks on land access street.</p>
	<p>Inappropriate location of "Stop Sign Ahead" advance warning signing.</p>	<p>Relocate the existing signing to a Point approximately 200 feet in advance of the stop signs.</p>	<p>The recommendation would eliminate potential motorist confusion caused by the presence of an intersection with uncontrolled approaches between "Stop Ahead" advance warning signing and the stop signs.</p>

Table 8 (Continued)

Issue	Deficiency	Recommended Action	Comments <sup>a</sup>
<b>TRAFFIC CONTROL DEVICES</b> (Continued)	Unclear "No Parking" regulatory signing <sup>b</sup> .	Replace existing "No Parking" regulatory signing with "No Parking" signing which has a single-headed arrow pointing in the direction that parking is regulated when the sign is at the end of a zone, or a double-headed arrow pointing both ways when the sign is at an intermediate point in a zone <sup>c</sup> .	The recommendation would clearly delineate no parking zones thereby eliminating any motorists confusion with respect which roadway segments have parking prohibited.
	Inappropriate "Slow Children At Play" warning signs.	Remove existing "Slow Children At Play" warning signs.	Where posted, these warning signs serve as a suggestion that playing in the street is acceptable behavior, a practice which should be discouraged.
	Inappropriate "No Thru Street" regulatory sign.	Replace existing "No Thru Street" regulatory sign with a "No Outlet" warning sign.	The recommended signage would more clearly warn motorists that they are entering a street from which there is no alternative means of egress.
	Initiate routine, periodic, traffic control device maintenance program.	Replace worn or faded traffic control Signing, and repaint worn or faded traffic control pavement markings.  Remove traffic control devices which are no longer necessary or appropriate.	The purpose of traffic control devices is to provide the warnings and guidance necessary to promote the safe and uniform traffic operations. In order to be effective, traffic control devices must command motorist attention and faded or worn traffic control devices which lack visibility do not command the necessary attention. Traffic control devices which are no longer necessary or are inappropriate may cause motorist confusion, and should be removed.

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<sup>a</sup>A more detailed description of each recommended action including advantages and disadvantages of each action is set forth in the "TRAFFIC CONTROL" section of the report.

<sup>b</sup>The "No Parking" regulatory signing message may read "No Parking" or "No Parking Any Time", but neither is clear as to the precise zone where parking is prohibited.

<sup>c</sup>The "No Parking" regulatory signing message may read "No Parking" or "No Parking Any Time", but must have an arrow to clearly define the precise zone where parking is prohibited. This action would require the posting of additional signing.

detrimental impact on driveways on the opposite side of the street; because only marginal improvement would be expected at the southern school driveway; and because of attendant costs. The Commission staff also considered but did not recommend reconstruction of the existing driveways and internal circulation roadway to reduce the gradient of the driveways because of potential storm water drainage problems and attendant costs. The final alternative considered, increased snow and ice control operations to reduce the slippery conditions, was recommended by the Commission staff.

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